

# **The Islamic World-system**

A study in polity–market interaction

**Masudul Alam Choudhury**

# The Islamic World-system

This highly original book presents an alternative vision of globalization and explores the epistemology, derived from the *Qur'an* and the Prophetic guidance *Sunnah*, that underpins the systemic unity at the heart of the Islamic concept of world-system.

Choudhury's investigation reveals the ethical foundations that influence the development of law, markets and social contract in Islamic societies. He then applies his methodology to issues and problems such as property rights, money, political economy, technology diffusion, microenterprise development and asset evaluation.

This book demonstrates that the Islamic world-system acquires its meaning from a single, integrated framework of complementary economic, social, institutional and market forces, rather than the competing opposites of mainstream theory. It will interest students and researchers of Islamic economics and world-systems.

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This book is dedicated to my friends and colleagues who helped me in establishing the Institute of Comparative World-Systems as an affiliated institute of higher learning and research of Southern University Bangladesh, Chittagong, Bangladesh.

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## Foreword

Events move apace and, at the time of writing, they include the apparent attempt by the US to mold Islamic countries (and thereafter the world) in its own image, which might not be too bad a thing if the institutions and practices of the US were to:

- lessen rich-poor division;
- introduce economic democracy including some form of secure income;
- focus financial activity on the real, productive economy;
- allow *everyone* to own productive capital;
- enable societies to control their own resources and their own destiny;
- end, or at least mitigate, the practice of *riba* (the imposition of interest);
- end a financial system bent on putting the whole globe into debt.

Unfortunately, it is scarcely conceivable that the US will do any of these things. Indeed, can anybody put hand to heart and swear to the likelihood of the US promoting an end to rich-poor division, providing a secure income, or eliminating the practice of *faat* money being used to make more money? Does anyone, beyond a small caucus of myopic power wielders, really think that the US genuinely wants to spread capital ownership, enable societies to control their own resources and destiny, end *riba*, and stop the financial system massively increasing global debt?

Of course not! The plain fact is that the US does not have a strategic vision, with the necessary associated practical detail, which can be of widespread appeal. And that is why millions of people have reservations about the US's attempt to mold Islamic countries. That is why there is worry, mistrust and resentment.

On the other hand, millions of people have reservations about the present condition of the Islamic countries, particularly the inhabitants. They abhor the rich-poor divisions, the oppressions and general lack of political, let alone economic, democracy. They are only too aware of the misery, unemployment and general dissatisfaction, which, finding no political outlet, is leading people to turn to violence. Above all, they are aware that their societies are not independent but controlled by others.

How, they ask, have these things come to pass? Why does the *Ummah* (the comity of Islamic societies) so patently languish? Why cannot the *Ummah* – with splendid achievement in the past, a massive intellectual and cultural heritage in the present, and bundles of obvious talent and resource with which to build the future – break from its lethargy and give an open, bold, exhilarating and very necessary lead to the world today?

The answer is – it can. The *Ummah* can correct the unhappy present and build a magnificent future if it understands the deceptions which demean it, lower its energies, exploit it, humiliate it, control it and in all possible ways prevent it from developing its full potential. Those deceptions relate to economics, morality and money, and their interrelation to each other. First, the *Ummah* is told that modern neoclassical economics is a world-encompassing science of objective process and universal value. The truth, however, is the opposite – modern neoclassical economics does not truly encompass the world, nor is it a science, nor does it possess universal value.

Second, the *Ummah* is told that the present economic framework and understanding suffice to analyze and uphold the whole social fabric, including morality and culture. The reality, however, is that economics, as presently conceived, threatens to undermine the social fabric and destroy morality and culture.

Third, the *Ummah* is told that the “free market” is free, fair and efficient and all its outcomes are just. The truth, however, is that “free market” is unfree if only because most people are in practice excluded from ownership of what creates a large part of the wealth – productive capital. It is unfair because of huge rich–poor differences and an abysmal treatment of carers, including women. And it is inefficient because despite the world having huge, undoubted technological, natural and human resource and capacity, poverty remains. As for the unfree “free market” claim that all its outcomes are just, well, anybody who believes that, will believe anything.

All of these matters, then, help us not to be surprised at the unfree “free market” claim that there can be an economics without ethics. We may well be horrified, but we are not surprised. We are certain, however, to be angered by the hypocrisy of the claim. *Every* economics or politics has values (which may, or may not, be good ones) at its core. If the unfree “free market” claim asserts differently, then it is blind to the values inherent in its own dogma and blind to the values which result from the implementation of its own policies and which cause the worry, mistrust and resentment.

So is there an answer to all this? Is there another way forward? Can the *Ummah* come to give an all-important lead?

Yes, it can, and the key thinking is already developing, such is its trenchant nature and such are the implications that the thinking may fairly be called a new paradigm. Bringing many strands together, it constitutes a fundamentally new approach to understanding reality, morality and

economics and their interrelation to each other. At its heart is the work of Professor Choudhury who, in his previous book *Money in Islam*, noted that economics without ethics can only be destructive. Crucially, he observed that the monetary system needed to express Islam must inevitably be different from that existing in the West. That is a key matter – much needing to be said – because, in a few simple words, it defies the arrogant Western belief that there is one, and only one, economic system of any efficacy in the world. Furthermore, it throws into doubt the brazen unfree “free market” claim that it implements an overriding social and economic justice. Most of all, it points out the nonsense of Francis Fukuyama who, in *The End of History* (1992), dared to assert that “free market” finance capitalism had triumphed and nothing much better is possible or desirable.

Familiar with, and well known to both the Western and Islamic academic worlds, Masudul Choudhury is of unique eminence and position, and perfectly placed to be able to understand the fundamental differences of views. In particular, he understands both the tremendous tragedy which will result if a completely one-sided view prevails and that something new, something big, has to be evolved if that tragedy is to be averted. In *The Islamic World-system* he focuses on the key issue – the design and practices of the present monetary system – and makes the key insight that, at present, money is created (created in effect from nothing) by the banking system *which then adds interest*. So when money is lent, it is *not* other people's money which is being lent (as is commonly believed), rather it is a new creation. At present in the West, most new money (in the United Kingdom it is an astonishing 97 percent) is *fiat* electronic money created by the commercial banking system and issued as *interest-bearing* loans. Such money has an essentially fraudulent origin, tends to be inflationary and can double or treble the cost of capital investment. Furthermore, while the payment of interest often includes payment for administrative expense, interest generally is *not* necessary and, in any case, is contrary to the beliefs of Islam.

All this, then, comes together in the form of a core understanding which can, and will, profoundly change for the better the future of the world – that the Islamic monetary system should create its own money supply and not, as largely at present, have to rely on credit creation by the commercial banking system. Put slightly differently, Islamic societies must control the money supply in their societies because, if they do not, they will be controlled by others. Thus we begin to get some comprehension of why the *Ummah* is languishing, with feelings of inadequacy and lack of independence.

The core understanding, moreover, goes further than mere independence to a recognition that the *Ummah* can come to have governance, control, empowerment and entitlement in a way which is, at present, totally inconceivable. Indeed, Choudhury gives the word “*Ummah*” a new creative meaning, seeing it not merely as a description of the comity of Islamic societies, but rather as a vision of a *new* comity of proud, self-reliant societies giving a lead to a world sorely in need of leadership. The new *Ummah*



rejects the present increasingly demeaning world order, with its autocratic classes and estranged elites in the Muslim world and the malignant power of usury everywhere, and replaces them with something honourable and uplifting.

All of this is impossible to the Western mind, governed as it is by a stupendous hubris. At the centre of the hubris is the thinking that nothing, nothing at all, can be changed without making somebody, somewhere, worse off. The mind-bending aspect of this is that it assumes that the current situation is perfect, or as nearly perfect as possible. It might be thought that Voltaire (in *Candide*, 1759) had destroyed that nonsense forever, but it flourishes today at the centre of unfree "free market" finance capitalism. Please do not think that this is a mere philosophical quibble. The issue is essentially about whether or not there is any will to try to end human physical and psychological pain. Despite its rhetoric to the contrary, neoclassical economics has little, even no will to make a proper effort to alleviate pain and misery because it makes the extraordinary assumption that improvements in one place for an individual or group are inevitable detriments elsewhere for another individual or group. Yet every sane person knows that improvement is possible – the world undoubtedly has enough productive capacity to eliminate poverty. Moreover, the *Qur'an* confirms this because it states that resources are truly abundant in the universe for the sustenance of all if they are produced and consumed with God-consciousness and ecological awareness.

Thus Islamic economic thought – at present largely subservient to Western economic thought – must break new ground if it is to restore dignity to the Islamic world. It will not be able to do that, however, unless it becomes premised on the epistemology of *Tawhid* and has a determination to think things out for itself. Put slightly differently, it must first recognise that there is a conflict with Western thought and then take encouragement from the fact that within Western thought there are divisions and therefore that conventional economics is no longer the supreme creature that it likes to think it is. So, anybody playing a part in, and consciously developing, the new paradigmatic thinking should know that they are not doing it completely alone.

And, if that is not encouragement enough, Islamic thinkers can look towards Malaysia which, in matters economic, financial and monetary, is quietly taking incremental and responsible initiatives and, above all, thinking for itself. A good example are the events of the 1998 financial crisis which opened with a shocking conspiracy to destroy a newly developing and responsibly administered nation. Fortunately, Prime Minister Mahathir (with but one key and very courageous adviser) defied the millions of words of advice proffered by the bankers, economists and politicians (all of which advice was to give in to the demands of the IMF and sell out Malaysia to foreigners) by doing the opposite. It was a very brave

thing to do but, within two years, the IMF was grudgingly forced to admit that Malaysia had made the right decision.

Now Malaysia is a market society and it reminds us that markets certainly have the potential to alleviate human want. Present market societies, however, do not necessarily ask themselves if their markets work justly and fairly for the benefit of all in society instead of for only a few. They do not ask if *everyone* has private property and a basic material security. They prefer to ignore what is wrong and so do not have to ask themselves what is right.

Masudul Choudhury, however, does the asking and, as part of his contribution towards the transformation of the *Ummah*, proposes that the issuance of money should be linked to gold (in the form of the Islamic *dinar*) with a 100 percent reserve requirement, i.e. if a sum of money is issued, there must be gold of equivalent value held in reserve. There are advantages in doing this, not least the creation of forces which prevent the continual debasement of the currency (as happens at present), discourage speculation and promote investment in the real economy. The rise, transformation and Islamic control of the *Ummah*, moreover, would be forwarded.

It should be remarked, however, that there are other possible ways of achieving a stable currency. Islamic control of the *Ummah*, concentration of resources on production and, in a market society, justice for everyone. One such way is set out in *Seven Steps to Justice* by Peter Challen and myself which observes that, rather than the banking system issuing interest-bearing loans, a state's central bank could (via the banking system) issue interest-free loans if the loans were to be used for public capital investment or (on the just market principles of binary economics) for private capital investment, thus creating new owners of capital. These uses would back the currency with real productive assets and be patently non-inflationary; indeed, they would be counter-inflationary.

Both Muslims and Christians would welcome the resulting benefits, including secure income for all, capital ownership for all and support for small business. In a fundamental way, poverty would be addressed, a focus made on the real, productive economy and societies enabled to control their own destinies. Above all, much progress would be made towards ending the grip of usury (interest) and the problem of debt would be addressed. Debt – individual, corporate, town, state and country – is now rocketing skywards in an exponential curve, exhausting the resources of the poor and their societies. Disaster threatens if something is not done. Fortunately, in an endeavour to do something and support the work of intellectual and moral leaders like Masudul Choudhury, a Global Justice Movement is developing and it has useful information on its net website.

So, let us welcome *The Islamic World-system* for its crucial contribution to a rebirth of the *Ummah*. Prior to that horrendous day – 11 September 2001 – few readers in the West, despite sharing common biblical roots, were able or willing to absorb serious studies of the Islamic tradition and

the culture it served. Happily, the situation is changing and many Western people now welcome inter-faith co-operation and the admirable lead of Masudul Choudhury towards the achievement of worldwide prosperity, peace and justice.

Rodney Shakespeare, Binary Economist

## Preface

The subject matter of knowledge is hot in the current literature on the global outburst of internet and high technology commodities. Many have written on this topic. Among the notable ones in recent times are Stehr (2002), Drucker (1989, 1993), Arrow (1962), Stigler (1961), Thurow (1996) and Lucas (1972); (also see Minford and Peel, 1983; Lucas and Sargent, 1978).

Stehr treats knowledge as a commodity in the sense of networking of global information technology in respect to individual and society's needs to keep up with this competitive trend. Drucker sees the advent of a post-industrial age to rest on the development of a strong service sector centered on the information revolution of the age of computers and high technology. Arrow sees the role of learning as information flow affecting the learning curve of efficient production. Stigler wrote on the theory of information economics. Thurow equated the global revolution of information technology with one of the major tectonic waves that are shaping the global order today. Lucas formalized his rational expectations of macroeconomics in terms of the adaptation of money and prices according to the knowledge available in the economy. The question asked is this: What is expected to be the immediate effect of a change in money supply on prices? If money supply is anticipated, an increase in the macroeconomic price level will be reflected in the built-in plan of the consumer on spending. Consequently, inflation results as an accepted fact. Otherwise, if the money supply is unanticipated, the price level gets a sudden shock but stabilizes when the unanticipated money creation is over. The economic system is therefore seen to respond to a flow of information on money supply, price level and output.

During the 1940s, the Austrian School of Economics championed the field of knowledge and economics. Among the notable names in this school are Hayek (1945) and Schumpeter (1962). Hayek wrote on the discursive nature of knowledge and its creative effect on development and technological change. Schumpeter wrote on the role of knowledge evolution in the process of the transition of societies from the feudal stage to its industrial transformation under changing patterns of economic life and development



under capitalism, socialism and beyond. The recent exponent of the Austrian School is Kirzner (1997). He re-introduced the Austrian discursive method into economic analysis to explain the process of creative evolution of modern entrepreneurial economic activity.

During the eighteenth-century European Enlightenment, the philosophers of science thought of knowledge along lines of epistemological and ontological questions. The question asked was: Is knowledge possible? Among the forerunners in this area of scholasticism were Kant (see Friedrich, 1977), Hume (1992) and Hegel (trans. Sibree, 1956). Kant thought of epistemology in terms of a priori knowledge totally contained within deductive reasoning. Hume thought of knowledge in terms of the essence of matter as a sensate object. That is, in terms of a posteriori inductive reasoning. Ever since, in the history of occidental philosophy of science the a priori and the a posteriori bases of knowledge remained separate and divided from each other, in spite of the recent project by Husserl (1965) on phenomenology to unify the domains of noumena and phenomena. This project could have proven to be a major breakthrough in the moral history of occidental philosophy and scientific methodology, if it became successful in introducing the unity of divine knowledge into a systems view of life. See footnote on Husserl's comment.<sup>1</sup> On the other side, Hegel championed the occidental basis of dialectical reasoning to explain the rise of the World-Spirit, which was a version of the convergence of history to the occidental pattern of society, civilization, technology and the global order as the unique one.

In international affairs the epistemological question is all the more alive today, as the world enters a conflict of civilizations despite how others would like to interpret the post-modernist era as one of civilization dialogue. This observation is validated on grounds of the post-modernist challenge to methodological foundationalism by a non-conventionalist approach in critical discourse.

The civilization confrontation of the near future is seen to dawn because of the nature of historical antinomy between Islam and the West. This relationship has always been one of misunderstanding based on cultural, economic and political conflicts. The social norms and conception of reality in all matters ranging from individual preferences to family to society, economy and nation states, and thereby to global geo-political perspectives, are disparate ideas between the two sides. The coming age has intensified this vehement conflict. At times the conflict has taken up signs of self-assertion by opposing values on either side. Ayatollah Khomeini's (1980) writings in this regard are an example of the intellectual challenge of Islam. At other times the opposition has assumed a dark picture of oppression and violence.

In this continuing conflict and rebirth under post-modernist inquiry the political players as a class have a short-term projected vision and future. The political players and the institutions of the two sides have deceived the

common good. All the more so on the Muslim side, the political rulers do not represent the grassroots Islamic views nor are they earnest to the Islamic cause. This is manifest in the utter failure of the Organization of Islamic Conferences (OIC) and the Arab League to resolve any of the conflicts between Muslim nations or otherwise to render a judgment against the American agenda and Western hegemony (Shakespeare, 2002).

The interpretation of civilization conflict we give here is different from the violent clash waged by the joint forces of Islam and Confucianism as advanced by Huntington (1993). In my book, I see the civilization conflict to arise ineluctably as a natural historic process of the bipolar movements. Each side gains its development within the evolution of contrasting wills and paradigms.

The emerging polarity is deepening the divide between the two sides on almost every precept of human existence and functions. Concepts have different etymological significance, as in the case of the post-modernist literary criticism. For instance, in Islam, justice means a complementary just and fair relationship between social and distributive justice, one feeding on the other by virtue of organizational behavior, legal institutions, economic instruments of participation and the formation of individual and social preferences. All these meanings spring from the premise of the Islamic Law, the *Shari'ah*.

The comity of Muslim nations under its collective will is construed to serve the preferences of those who imbibe the values and understanding of the Islamic transformation rather than those outside its fold. This is the Islamic equivalence of the meaning of the grassroots in respect to knowledge, practice and the advancing of Islamic values, organization, institutions and their functions. Put simply, this means total Islamic governance.

In the global order, the manifestation of the Islam-West conflict can be seen in trade and development relations. If the Muslim nations, today, transform to the Islamic governance of their own future, they are bound to give a massive blow to the capitalist globalization process sponsored by the West and which has taken an impoverishing toll on the Muslim World. There are those who have been made to believe that capitalist globalization is the final answer (Fukuyama, 1992). Muslim nations are told that their staying out of it would be a disaster in terms of economic efficiency and WTO penalties. These are pronouncements found to ensue from the Bretton Woods Institutions and their sister organizations. In this regard, Arab nations have passionately courted the World Trade Organization's agenda. Yet there can be nothing more distant from the truth of self-reliance.

Contrarily, Islamic self-reliance in its own meaning of the globalization process works by market forces and natural propensities. Such a natural emergence of the collective will of the Islamic grassroots would yield governance, control, empowerment and entitlement of the Islamic future. The

collective will of the new age of Islamic nations is, thus, seen as a process of transformation of the present decrepit Muslim World into the future world nation of Islam called the *Ummah*. This process is a transformation that is not enforced by political and estranged West-Islam relations. It arises naturally from the language of market reality in the sphere of trade and development, money, economy, finance and the institutions that support these activities.<sup>2</sup> Such creativity comes about as the result of the inner dynamics of a re-constructive civilization force. The momentum of the change is inevitably a rejection of the increasingly demeaning world order that the capitalist world-system and its technological, economic, political and social artifacts have engendered.

When such conflicts have heaved heavy on the Muslim nations today, the time has turned out to be one of inner questioning and rising conflicts. This type of discontent and bi-polarity is felt today both within the Muslim World, which has been suppressed for long by the oppression of the West and by the alienated rulers of the Muslim World in the interest of Western belligerent designs. Consequently, within the Islamic awakening, no political legitimacy is left for the continued presence of the autocratic classes and their Western supporters in the Muslim World (Sardar, 1988).

An academic examination of the underlying and growing conflict between the West and Islam as a divide between contrasting worldviews is a theme first of discerning the divergent roots of knowledge in these polar systems. This forms an inquiry in epistemology and ontology as the foundations of the new praxis and paradigm shifts (Choudhury, 1998). The same epistemological and ontological praxis then formulates behavior and re-constructs the environing diversity. Within this diversity are individuals, family, society, markets, economy, the economic, financial and political institutions and their upward extension to the *Ummatic* global order. Such an expansion encompasses the masses of Muslim peoples across nation states and the sub-nation of Islam in the West (Choudhury, 1995).

On such a divergent epistemological and ontological order of thinking affecting the entire diversity of existence, wrote the exponents of Islamic scholasticism. Among them were Ibn Al-Arabi, Imam Ghazzali, Imam Fakhruddin Razi, Imam Shatibi, Imam Ibn Taimiyyah, Ibn al-Qayyim, Shah Waliullah and Shuhrawardy. These were the pioneers of the epistemology of *Tawhid* (Oneness of God as in the *Qur'an*) and the development of the *Shari'ah*, Islamic Law. In recent times, the names of Malek Ben Nabi and Muhammad Iqbal are prominent (Choudhury, 2003). On the other side of the scholastic school are those who tried to imbibe on the Hellenic influence in their philosophical thoughts. In this school were Al-Kindi, Ibn Rushd (Averroes), Ibn Sina (Avicenna), Al-Farabi and Ibn Khaldun. They comprised the school of the Muslim rationalists rather than the Islamic *weltanschauung*. The ideas of the two variant schools marked an early tension between the Islamic epistemologists and the Hellenized

rationalists in the history of Muslim civilization. Yet, in this book, we do not associate with this philosophical relativism the universal principle of historicism propounded by the *Qur'an* and that remains explained without any space-time limitation.

The early scholastic debates were healthy intellectual discourses between the two contending sides. That healthy intellectual experience is evinced profoundly in the critical dialogue between Imam Ghazzali and Ibn Rushd. Ghazzali wrote his refutation to the philosophy of Ibn Rushd, Ibn Sina and Farabi in his *Tahafut al-Falsafah* (Incoherence of the Philosophers) (Ghazzali, trans. Marmura, 1997). Ibn Rushd wrote his *Tahafut al-Tahafut* (Incoherence of the Incoherent) (Qadri, 1988) as a counter refutation to Ghazzali.

But in later years, with the colonial onslaught upon, and subjugation of, the Muslim World compounded by its inner intellectual slumber, oppressed further by crippling autocratic rule, the spirit of intellectual inquiry went into lethargy, though it was never dead. The Muslim nations became consumer nations and a hinterland for Western mercantilism. Today, the same enigma continues in the hands of autocratic rulers and the estranged elite of the Muslim World.

In spite of these grim conditions, the Muslim World's grassroots are seen to rise with new vigor and expression. The expression of the age is a mix between denial, opposition and violence to that hegemonic but fast disappearing monolith. This transformation is appearing both in the realm of intellectual thought and positive action. In the words of the famous historian Arthur Gibbons, the sleeping Islamic World will awake even if it has slumbered as long as the seven sleepers of Ephesus. This is becoming increasingly clear today by the strange twist of fate and realization after the destruction of the Twin Towers and by the frenzy of the West to hold on to its vested interest, the American interest, in the Muslim World. This sudden awareness and the impending Islamic revival, despite Western frenzy to halt it, is explained eloquently by Esposito (1992) (see also Piscatori (1986)).

In this book we will provoke an answer to the question: Where lies the epistemological and ontological rebirth of Islam in the post-modern age? What will be the shape and form, content and application of this Islamic rebirth? The epistemological and ontological roots of Islamic knowledge are found in the *Qur'an* and the *Sunnah* (guidance of the Prophet Muhammad), respectively. This total premise of intellectual reference and action remains an indelible historical fact. It marks the continuation and rebirth of Islamic universalism. The epistemological and ontological premise will once again be the foundation of the intellectual challenge in the new age and the renewed expression of the Islamic grassroots against the inimical agenda. As someone said, there is no science without epistemology. So, also, there is no rebirth of a civilization without its authentic epistemological reference, its subsequent actions and responses.



In this book we will bring out some of the momentous depth of scientific and original inquiry in Islamic epistemological scholarship. We will open up the story of the divide between two contrasting civilizations, nay, between the only two divergent realities. They are of truth versus falsehood; that is, of the Oneness of Allah or God (*Tawhid*) versus the rationalism of anthropomorphic perceptions. The study of these two divergent world-views and their constructs will comprise our theme on the Islamic world-system. We will limit this study to the study of polity-market interaction as an example of a much wider expanse of intellectual domain.

## Notes

- 1 Husserl wrote in his *Phenomenology and the Crisis of Philosophy* (1965, p. 155):

Blinded by naturalism, the practitioners of humanistic sciences have completely neglected even to pose the problem of a universal and pure science of spirit and to speak of a theory of the essence of spirit, a theory that pursues what is unconditionally universal in the spiritual order with its own elements and its own laws. Yet this last should be done with a view to gaining thereby scientific explanations in an absolutely conclusive sense.

- 2 *Ummatic* transformation according to market-driven impulses.

Trade and development on all fronts is the starting point of self-reliance for the rise of the *Ummah*, the conscious world nation of Islam. Yet, to tread a safe path toward this realization, the existing Muslim governments would neither come forth on their own, nor would they adopt such policies and then change institutions for realizing financial, monetary, trade and development self-reliance. The Muslim nations have been captured by the machinery of the West, which is manifested in their binding commitments to the IMF and the WTO.

The *Ummatic* transformation must arise from market-driven processes. Hence, such awakening will come from the business, entrepreneurial, trading and organizational dynamics of the global Muslim grassroots. On the market-driven process of *Ummatic* transformation, no one can clamp impediments and hegemony. In this respect, we formalize here how a market-driven process in trade and development for self-reliance can come about.

In Figure P.1 we devise a post-*Ummatic* transformation picture on international trade. The post-*Ummatic* traded quantity shows that  $X_1$  increases to  $X_1'$ . This is the compound effect of supply shift from  $S_1$  to  $S_1'$  and demand shift from  $D_1$  to  $D_1'$  for the *Ummah*. These changes result from inter-communal production diversification within the *Ummah*. In the 'other' trading world with given resources, trade is naturally withdrawn from  $X_2$  to  $X_2'$ . Supply shrinks from  $S_2$  to  $S_2'$ ; demand remains unchanged at  $D_2$ . The Islamic world's terms-of-trade stabilize at the level  $P_1$ . After post-*Ummatic* adjustment we obtain  $(X_1' - X_1) = (X_2 - X_2')$ .

The above trade effects are felt both in the export and import sides. Export effect is shown by the shift in the *Ummatic* inter-communal supply curve. Import effect is shown by the *Ummatic* demand shift. On the side of trade with the outside world an increasing production diversification and output expansion will follow the *Ummatic* transformation. There will be less dependence on import from the outside world. Thus, on the matter of imports from the other world, there is a reduction in import dependence by the degree to which product

diversification occurs. Hence, higher external terms-of-trade are maintained while preferential trading arrangements exist within the *Ummah*. The role of monetary and financial policy harmonization, the institutional impact of human resource development and the establishment of an Institute of Technology Development can contribute to this momentum of *Ummatic* change.

The above kinds of transformation depend upon, and arise from, purely market-driven forces of inter-communal trading and development arrangement. The shifts in the supply curve and the demand curve post-*Ummatic* transformation, and the stabilization of the terms-of-trade globally, are due to developmental impetus within the *Ummah* in relation to the global order.

Now, the following changes in export revenues and their developmental effects can be noted: let the revenue generated within the Muslim World post-*Ummatic* transformation be given by:

$$\text{Rev}_1, \text{Rev}_1 = p_1 X_1'$$

Let the revenue generated from trade outside the *Ummah* be given by:

$$\text{Rev}_2 = p_1 X_2'$$

Since post-*Ummatic* transformation would be expected to generate  $X_1' > X_1$ , therefore, change in revenue post-*Ummatic* transformation is given by:

$$\Delta R = p_1(X_1' - X_1) > 0.$$

Net change in revenue is given by:

$$\begin{aligned} \Delta R &= p_1(X_1' - X_1) - (p_1 X_2' - p_2 X_2) \\ &= p_1(X_1' - X_1) + (p_2 X_2 - p_1 X_1) > 0 \end{aligned}$$

Here, we note that  $(X_1' - X_1) > 0$ ; and in the pre-*Ummatic* situation:

$$p_2 X_2 > p_1 X_1$$

From the net total revenue for the *Ummah*,  $R = p_1(X_1' + X_2')$  is generated the development fund for the *Ummah* to be used in production expansion and economic diversification, economic and financial stabilization, and for development purposes. Let the fund percentage so applied be 'a'. Hence, the development fund,  $DF = aR$ .

A knowledge-induced transformation process in trade mobilization within the *Ummah* is, thus, established on the basis of the primal goal of bringing about greater interaction, integration and dynamic evolution of the *Ummah*. This knowledge-flow denoted by  $\theta$  is derived from the fundamental praxis of unity of knowledge (*Tawhid*), now applied to the practical issues of trade and development co-operation in the *Ummah* along with concurrent issues that need to be addressed, i.e. monetary and financial stabilization, 100 percent reserve requirement with the gold standard, human resource development and technology matters.

The terms-of-trade with the outside world are at a low level,  $P_1$  (commodity and resource composition of present-day trade in Muslim countries). Contrarily, there is stabilization of prices post-*Ummatic* transformation from the level  $P_1'$  to  $P_1$ . There will be further stabilization in prices and benefits for the *Ummah* as part of the revenues from post-*Ummatic* transformation is turned into a development fund for the common good.



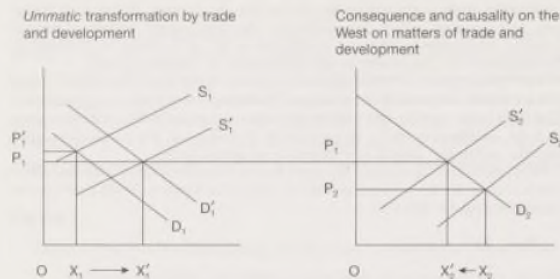


Figure P.1 Trade and development necessary for *Ummatic* transformation

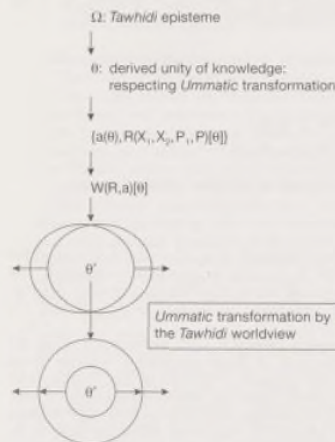


Figure P.2 Knowledge-induced *Ummatic* transformation according to the *Tawhidi* praxis: the case of trade and its concurrent development, financial, monetary and economic issues

When the above changes are taken up in respect to the *Tawhidi* worldview applied to *Ummatic* transformation, we continue with the methodological explanation. In the continuously learning and *Ummatic* evolutionary world-system we formalize the following recursive interrelationship of *Ummatic* transformation according to the *Tawhidi* ( $\Omega$ ) praxis:

Let  $P$  denote the programs that emanate from monetary, financial, entrepreneurial, human resource and technology development respecting the interlinked menus of production and consumption within the concept of *Ummatic* wellbeing,  $W(R, a)[\theta]$ . Here, each of the variables is induced by the knowledge-induction on the basis of the principle of unity of knowledge applied now to the particular issue of *Ummatic* trade and development. The continuation of new knowledge values,  $\theta'$  and its onwards recursive relationships, as shown, mark the creative dynamics of *Ummatic* evolution.

The evolutionary nature of the *Ummah* in response to the *Tawhidi* methodology of unity of knowledge is shown in Figure P.2. Arrows in Figure P.2 indicate the creative *Ummatic* evolution.

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My greatest aspiration in writing this book has been to excite a dialogue between the academia of the Islamic and Western Worlds on the methodology and application of a revolutionary praxis premised on the unity of

divine knowledge. The author has actively and extensively pursued this scientific research program for the last two decades. It led to several learned publications.

The present book project has further proven that the praxis of unity of divine knowledge in the study of formal systems is not bound by time-space limitations of cultures and peoples. It transcends these limitations by its universality across a unified systemic view of life and thought studied in the most rigorous of terms.

## Introduction

The project of the world-system covers the field of epistemological questions rooted in civilization and cultures that have shaped the relation of nations to the global order. This relationship has appeared in history in various forms. First, there is the fundamental theme of discerning the values and preferences of people in accordance with their beliefs that enter the formation of particular aspects of markets and institutions, wants and needs, organization and political behavior within nation states and these in relation with the global order.

### The capitalist world-system and the Islamic world-system

The capitalist world-system thus became the venue of deliberation for Immanuel Wallerstein. For Hegel, civilization as the world-system was described in terms of the philosophy of Western history. For Immanuel Kant, the deductive method was the world-system in a deductive form of reasoning. For David Hume, it was an ontological or inductive way of reasoning in the sciences. In recent times, for James Buchanan, the world-system takes the nature of a description of methodological individualism at play in the formation of Western social contract, and so on.

In the Islamic world-system project we likewise examine and derive from the epistemology of the *Qur'an* and the Guidance of the Prophet Muhammad (*Sunnah*) and then take up the historical contributions of the great age of Islamic scholasticism to learning and erudition. These together formed the sum total of the Islamic civilization with its own values, morality, social contract and the relation between such values and the market order. With the latter comes to interface the social and institutional order. Man is perceived differently in terms of its capacity to attain moral heights.

In the Islamic world-system the governing principle of the *Qur'anic* epistemology, combined with the ontology of the *Sunnah* as that which explains the *Qur'anic* rules for actionable effect in life, is premised on the relationship of the world to the primal and the final completeness, absoluteness and perfection of knowledge. The relational order of the universe in terms of



these three domains configures the Islamic world-system in reference to the following causality: "From *Tawhid*, the Oneness of Allah in the primal to the world-system (*Alameen*) to the Final End in the Hereafter, *Akhira*".

This relationship is causal because of the equivalence of *Tawhid* with *Akhira* in terms of the complete, absolute and perfectly divine knowledge from which the world-systems derive their meaning and continuously learn. The above, seemingly simple, relationship becomes substantively extensive, detailed and complex in the study of interactive, integrative and evolutionary systems that are permanently governed by the unity of divine knowledge. The worldly knowledge-flows thus emanate from the primal domain of the Oneness of God (*Allah*), termed as *Tawhid*, and ends in the final completion of that knowledge being manifest in the Hereafter, termed as *Akhira*. The world-systems called *Alameen* in the *Qur'an* abide between these two equivalent end points. They derive their knowledge-flows and the knowledge-induced entities in them from the domain of the divine laws that remain perfect, absolute and complete. Yet, the knowledge-flows by themselves are interactively and consensually evolved in the world-systems between the entities that are knowledge-induced. This permanent process of being and becoming, ending only in the Hereafter, becomes the methodology of the total Islamic world-system.

On such a perspective of the world-system the great Islamic scholastics thought and wrote. Among them were Imam Ghazzali, Ibn Khaldun, Ibn Rushd (Averroes) and Ibn Sina (Avicenna). In recent times, Dr Muhammad Iqbal and Malek Ben Nabi examined similar ideas on the discursion of knowledge in process-oriented world-systems.

This book is a rigorous study of the methodology of the *Qur'anic* epistemology, together with the ontology of guidance, the *Sunnah* of the Prophet Muhammad and the scholarly discourse contributed by the learned in Islam, called *Ijtihad*. The discovery of this methodology in this book, as done elsewhere by this author over a decade, becomes a praxis for all issues and problems of diverse world-systems. The methodology remains unique. Variations are simply in the specific problems of different issues, disciplines and, thus, world-systems. We have established this fact of methodological universality of the unity of divine knowledge in various topics of diverse world-systems.

### Initial definitions of analytical concepts

Even though we treat the methodology within the conceptual part of the book, it is summarily repeated in various chapters to keep the reference of the background issue in perspective. Also, in various chapters we have used certain terms that should be briefly defined here at the outset. In this regard, the philosophical and mathematical orientation of the methodology of *Tawhid* unity of knowledge has demanded the use of the concepts of topology, cardinality and super-cardinality and the super-manifold.

### Topology

By topology we mean the mathematical space of sets that is open without bounds and its subsets replete with the same parental characteristics. The mathematical union and intersection of the subsets belong to the parental open set. A topology is a dimensionless mathematical entity. Hence, it is most effective in explaining relations. In the *Tawhidi* worldview there is no corporeal cognition of *Allah* and of *Allah's* measure. Even the primordial relationship of the world-systems to *Allah* is an immeasurable one. The only thing that matters is a non-dimensionless analysis relating to the triple, *Allah*, the world-system and the Hereafter. The circular interrelationship in this is premised on the divine unity of knowledge.

Hence, we are explaining the conception and knowledge-induced relations and measuring such relations rather than forms, to the extent that they can be measured in the world-systems. Otherwise, in the case of immeasurability of the relations, we exercise the institutional or abstract but impacting consequences of the primordial relations emanating from the premise of *Allah* and the Hereafter. These analytics take deep meanings in the Islamic world-system theory that we will expound in this book.

Technically, we define an open topology (thus for  $\Omega$ ) as follows. We treat open subsets of  $\Omega$  and  $\Omega$  as an open topology because of the open and unbounded domain of *Allah* and the Hereafter, from which all relations emanate to define the Islamic world-system. Also, the knowledge-induced subsets are ever evolving in open spaces.

$\Omega$  is defined as a topology of the class of open sets contained in it when,

- 1  $\Omega$  is an open set (super-space);
- 2  $X$  is a non-empty set (space) belonging to  $\Omega$ ;
- 3  $\{Y_i\}$  is a class of subsets of  $X$  belonging to  $\Omega$ ;
- 4 The null set  $\phi$  belongs to  $\Omega$ ;
- 5  $\cup Y_i$  belongs to  $\Omega$ ;
- 6  $\cap Y_i$  belongs to  $\Omega$ .

In our *Tawhidi* treatment of world-systems,  $\Omega$  denotes the domain of the divine laws (*Sunnat Allah*).  $X$  denotes the interactive, integrative and evolutionary (IIE) bundles of knowledge-flows and their induced forms according to the precept of unity of knowledge within the processes of the knowledge-induced events spanning the very large-scale universe [ $\Omega \rightarrow \Omega = H$  the Hereafter].  $Y_i$  is the similar bundle within a given process, for  $i = 1, 2, 3, \dots$  processes.  $\phi$  denotes the complementation of Truth, that is Falsehood domain,  $Z$  has a null (opposite) intersection with  $X \cap Z = \phi$ . Thereby,  $Z_i \cap Y_i = \phi$ ,  $i$  is taken pair-wise over Truth and Falsehood across each and every process. In this book we will define  $Z = \{Z_i\}$  as the "de-knowledge" domain.

We also use the idea of cardinality and super-cardinality in the course of several concepts in this book. We will define these two mathematical ideas at the outset, now.

### Cardinality

Cardinality is the concept associated with the increasing sequences of infinities of classes of number sets, each of which is endowed by its own infinity. Such an ascending sequence of numbers with their increasing range of infinities is  $\omega_1 = \{n, 2^n, (2^n)^n, \dots\}$ . This sequence itself has its own infinity.

The concept of super-cardinality is my coined term to indicate that the universal set  $\Omega$  at the primordial level of the divine laws (*Sunnat Allah*) being the space of all sets driven by knowledge and de-knowledge, its infinity must be higher than the infinity of any of its subsets. Such a cardinality measure is outside the domain of the transfinite numbers and generates all the other infinities of the transfinite numbers.

We write the following sequence,  $\mu = \{\omega_1, \omega_2, \dots\}$ , where  $\omega_1 = \{n, 2^n, (2^n)^n, ((2^n)^n)^n, \dots\}$ ,  $\omega_2 = \{\omega_1, 2^{\omega_1}, (2^{\omega_1})^{\omega_1}, ((2^{\omega_1})^{\omega_1})^{\omega_1}, \dots\}$  etc. in this way. We can keep on repeating sequences for  $\{v = \{\mu_1, \mu_2, \mu_3, \dots\}, \dots, \lambda = \{\eta_1, \eta_2, \eta_3, \dots\}, \dots\}$ .

### Super-cardinality

Ultimately, by a notation we define super-cardinality as the cardinality of the all-encompassing universal set as,  $SC(\Omega) \gg \text{Card}[x = \{\omega, \mu, v, \lambda, \dots\}]$ . Now all that we can say in respect to such transfinite comparison with  $\Omega$  is that the Islamic world-system is exogenously but functionally constructed in reference to  $\Omega$ .

### Super-manifold

Finally, we need to explain the concept of super-manifold, which we have also used in reference to  $\Omega$ . The super-manifold is the totality of the evolutionary knowledge-induced nexus formed by unity of knowledge. In notation, we explain it by,  $SM(\Omega) = \int_{\theta \in \text{Card}(\Omega)} W(\theta, \mathbf{X}(\theta)) d\theta$ ,  $\theta \in \Omega$ . This is an evolutionary functional with bold symbols signifying vectors of interconnected systemic variables and their relations.

### About the book

The topics covered in this book are first a series of theoretical and conceptual chapters that establish the praxis of unity of divine Oneness in its undeniably methodological rigor with increasing depth. This part of the book comprises Chapters 1 to 3.

Part 2 applies the methodology of Oneness of divine knowledge in terms of the laws so derived from the *Qur'an* and explained by the ontology of the *Sunnah*. This part comprises Chapters 4 to 9. In this part the methodology of the interactive, integrative and evolutionary (IIE) knowledge-centered world-system (*Alameen*), also called the *Shuratic* process in reference

to the process-oriented methodology of the extensively participatory and relational universe depicted by the *Qur'an*, is applied to the following topics: Islamic political economy, a general theory of social systems with family and ecology as examples, Ibn Khaldun's theory of dialectics in civilization, nature and function of money in Islam, knowledge-induced technological change in the sense of the unity of systems and machines, and valuation of assets using a model that responds to simulation of knowledge across overlapping generations and globalization from the comparative views of Islam and capitalism. Chapter 10 is a conclusion.

It is hoped that this book will present a revolutionary perspective on the epistemology of a new methodology that configures all relationships in every world-system in terms of the unity of knowledge and develops the scope for its application. The intrinsically interactive, integrative and evolutionary (IIE) nature of the knowledge-centered and process-oriented methodology has enabled us to study the market and institutional interaction by means of that unique methodology. A study of strong social, economic and institutional interaction as part of the nature of social systems would not be possible without such a methodology. We thus derive, in the end, that the discovered methodology of the knowledge-centered world-view must indeed be unique and fundamental in the scheme of things.

## Part 1

# Theoretical perspectives

# 1 A theory of the Islamic world-system

The principal objective of this chapter is to delineate the contrasting views between the *Qur'anic* and other world-systems approaches to the understanding of certain economic issues. This chapter does not undertake details on the various concepts discussed, but alerts the reader to the substantive treatment of these issues in the later chapters and the focus towards which the book is oriented. Also, the exemplary contrasts shown here between the Islamic and mainstream approaches to the issues discussed are of a broader relevance to all classes of issues and problems taken up in the study of interaction between market, polity and socio-scientific forces.

First, therefore, in this chapter the focus is on delineating the contrast between the Islamic asset valuation methods and the neoclassical idea of Pareto-optimality, optimal and equilibrium resource allocation. All these alien concepts have pervaded the literature of Islamic economics. This methodological difference between the two worldviews is of a universal and substantive nature. Its implications signal the much wider contrast between the pervasively interactive, integrative and creatively evolutionary nature of the Islamic world-system and the competing and marginalizing nature of neoclassicism in the Western worldview of science, institution, society and economy.

Thus, from this initial critical examination of selected concepts will be shown to evolve the generalized methodology of interaction, integration and evolution (IIE). Such a methodology is shown to emanate in a natural way from the *Qur'anic* epistemological premise relating to all issues of an entire class of world-systems. The Islamic world-system comprises the totality of such classes of world-systems that are guided by and evolve in a natural way within the premise of the *Qur'anic* epistemology as substantively characterized by a coherently unified order of complementarities. The methodology of studying the Islamic world-system is contained within the *Qur'anic* worldview of unity within diversity that is further constructed and evolved through a knowledge-centered order of interaction, integration and creative evolution (IIE). This substantive methodology becomes the premise for the study of polity-market interaction in the Islamic world-system. It will be the central theme of this book. Using it, the topic of polity-market interaction will be studied.



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Since the nature of pervasive complementarities in the Islamic world-view and of marginalist substitution in neoclassicism and all their prototypical developments in the academia and institutions mark the core elements of the two contrasting worldviews, we commence here by examining the alien nature of the Pareto-optimality concept in the context of an Islamic socio-scientific thinking, be this for economics or any other field. I shall go on to prove the alien nature not simply of Pareto-optimality as a concept but of the entire occidental episteme of a scientific system that is structurally insensitive to the essence of systemic unity, which emanates from the epistemological root of divine Oneness. This divine Oneness as the unity of divine knowledge is termed as *Tawhid* in the *Qur'an*. It is the episteme that projects a universally determining role in the entire organization of life, thought and experience in the Islamic world-system, which in turn is made up of an infinitude of sub-systems, all governed by the same episteme.

### Delineating the Islamic knowledge-centered reality: the paired universes of the *Qur'an*

Consider a geometrical point in the positive quadrant of, say, the economic universe. In the learning universe of the *Qur'an* that bestows knowledge-induction in all things, this most elementary point has been learning cumulatively, incessantly and continuously from the moment *Allah* ordered creation and continues to command the universes (*Alameen*) to be unraveled (*kun fa-ya-kun*). In the inspired saying of the Prophet Muhammad termed as *Hadith al-Qudsi*, this primordial writ of the knowledge-endowed universe in which the elementary point charts its way, is beautifully explained by reference to the mystic pen that was commanded by *Allah* to write at the moment of creation. The mystic pen said, "O Lord! What would I write?" *Allah* commanded the pen to write from the Beginning to the End. Thus the passage of the creative point commenced from the Beginning of Creation to its incremental manifestation in the world-systems. In this cumulative way the incessant writing of knowledge by the mystic pen is leading all the world-systems toward the End, which is the Event of Completion and of the evident unraveling of the true and complete knowledge that is *Allah's* alone. Such a terminal Event becomes equivalent and identical to the primal Event, which is *Tawhid*. Yet, in the primordial Event *Tawhid* remains in its intrinsic but not manifested completion and absoluteness of divine knowledge. Only the End Event unravels that complete knowledge, which is *Allah's* alone. Thus, the End Event called *Akhira* (A) is identical and equivalent to the primal Event called *Tawhid* (T) and the process of progression from T to A is through the creative evolution of the Islamic world-system comprising infinitudes of world-systems.

Thus, the knowledge induced in the continuously learning geometrical point commences from *Tawhid*. *Allah* says in the *Qur'an* (92:13), "I am the

End." The verse proceeds on to mention *Allah* in the Beginning: "I am the Beginning" (92:13). In the microscopic universe, as in the very large world-system, the reference to the Beginning and the End spans over all and every infinitesimal sub-system spanning life, thought and existence. The *Qur'an* refers to the microscopically knowledge-induced events and their knowledge-transmitting relations as the Signs of *Allah* (*Ayath al-Allah*) (6:95-99). It refers to the most macroscopically complete universal Event as *Al Haqqa* (*Qur'an* Chapter 69, the True Reality), also as *Al-Naba Al-Azim* (*Qur'an* Chapter 77, the Great Message) and as *Al-Ghasiya* (*Qur'an* Chapter 88, the Overwhelming Event).

Our elementary geometrical point is thus a conscious entity receiving, recognizing, deriving knowledge-flows from the epistemology of the Full Stock of Knowledge that is *Tawhid* and then evolving along with its experience to ever more understanding of the systemic unity derived from *Tawhid* as this remains intrinsic in the order of things. The only passage of the learning point is from *Tawhid* in the primal to *Tawhid* in the *Akhira*. This complete path encompasses the entire divinely completed knowledge that spans across all the known (*Al-Alimul Bayyana*) and the unknown world-systems (*Al-Alimul Ghayb*). Through this passage the learning point grows in its experience of systemic unity as derived and applied in reference to the divine Stock by a cogent class of instruments and organization of life, thought and action. The resulting passage of guidance in such a learning experience is referred to in the *Qur'an* as *Sirat al-Mustaqim*, the straight path of truth and righteousness.

The learning geometrical point thus goes through co-determined experience by the Will and Command of *Allah* in relation to the universe and the *Akhira*. The existence and sustainability of the learning geometrical point is premised on the Unity of Knowledge by which *Allah* has created the learning point. But *Allah* has also created it in the midst of its own community (*ummanun*). The geometrical point is thus a member of a family of "pairs" or relational complements united by knowledge as derived from the *Tawhidi* episteme (*Tawhidi un-Bahij*). Such "pairs" unravel the unity of the universe in the midst of the unity of knowledge. In this regard the *Qur'an* declares (13:3):

And it is He Who spread out the earth, and set thereon mountains standing firm, and (flowing) rivers: and fruit of every kind He made in pairs, two and two: He draws the Night as a veil over the Day. Behold, verily in these things there are Signs for those who consider!

At the very moment the "pairs" are consciously recognized in their world-systems, a sense of observation and creative reflection occurs (*Tafaqqur*). Such a state, in turn, leads into heightened experience of the same sense of acknowledgment of the divine reality and its manifestation of unity by

systemic relations in the scheme of all things. This realization forms the moment of the conscious recognition of the Signs of *Allah* (*Ayath Allah*).

The primordial knowledge-centered universe is established in the *Qur'an* by the statement that *Allah* created the universe only by His Command, that is His Primal Knowledge. *Allah* then created the physical artifacts to carry that knowledge in it – "Praise be to *Allah*, Who created (out of nothing) the heavens and the earth, who made the angels messengers with wings, – two, or three, or four (Pairs): He adds to Creation as He pleases: for *Allah* has power over all things" (*Qur'an* 35:1). Coterminous with the divine command the physical universe appeared, causing all artifacts and cognitions to be knowledge-induced by simultaneity of relations between the order of knowledge and its act of creation. The relationship between these two states in the world-systems proceeds by a delayed speed in acquiring knowledge by the mind. But primordially, the delay between knowledge and experience disappears. What arises is a perfect complement, a simultaneity that is simply a knowledge-induced bundle par excellence. This category is not one without the other in the scale of eminence and materiality. Eminence and materiality are simultaneous. Because of this disappearance of sequencing between knowledge and events, the concept of temporal time does not appear in the Act of *Allah* as a primal and independent entity. Hence, the dynamics of human understanding is premised on the plane of knowledge alone, not on time. Time itself becomes a created entity of knowledge. Only in the perfect order of simultaneity do time and knowledge equate.

The learning geometrical point is thus a Sign of *Allah* bestowing on the conscious observer the reflection of its intrinsic unity of knowledge in which it is a part. The environing totality of the learning point is the consciously learning universe of *interrelating* entities. Such a universe comprises the world-system of learning and evolving by "pairs." The relational order of the interacting, integrating and creatively evolving points is inseparably and causally linked with the episteme of the unity of knowledge and life (*Tauhid*).

The entire Creation is thus the evanescent and fathomless ocean of knowledge of divine Oneness. It is interacted, integrated and creatively evolved by *interrelationships* within and between experiential entities. The *Qur'an* says in this regard (41:53), "Soon will We show them Our Signs in the (furthest) regions (of the earth), and in their own souls, until it becomes manifest to them that this is the Truth. Is it not enough that your Lord does witness all things?". A verse on the richness of the unity of creation by knowledge and knowledge-induced Signs of *Allah* (*Ayath Allah*) is this (31:27), "And if all the trees on earth were pens . . . Ocean (were ink) with seven Oceans behind it . . . yet would not the Words of *Allah* be exhausted . . . Full of Wisdom."

### Pairing as pervasive complementarities in the knowledge-centered world-system

The above introduction on the divinely ordained creative purpose is settled on the premise of unity of knowledge in the midst of *relational* "pairs." How are these "pairs" recognized in the midst of the fathomless ocean of knowledge of divine unity as stated in the above-mentioned verse?

*Allah* has created knowledge-induced entities out of His complete stock of knowledge from which emanate incremental bits of knowledge. We refer to the derived knowledge of unity as knowledge-flows. They are rendered to the mind, and thereafter to the world-systems, by cogent sets of behavior, organization and instruments that extract the episteme of unity by means of knowledge followed by its application to diverse issues and problems of the world-systems.

According to the *Qur'an*, the derivation of knowledge-flow from the episteme of divine Oneness is realized through the cosmic *Shura* (consultation but broadly meaning participation and hence complementarities). The *Shura* is both a human and non-human related process of deriving unity of knowledge on the basis of *Tauhid* as the episteme. In the world-system of mind and matter there exists pervasive interaction. Through interaction arises integration as the sign of a unifying convergence or consensus. This integration, in turn, is followed by creative evolution of the processes of interaction and integration occurring in the continuum of the knowledge-induced conscious universe.

Like the human world, the non-human world-system is embedded in its community of interrelated entities. This intrinsic experience of mind and matter is referred to in the *Qur'an* as the bestowing of the divine essence in everything (*Fitra*). The mobilization of unity of knowledge between entities in the world-systems takes place through the *Fitra* of the human order. Thus, there is a unique essence of the unity of knowledge in the human capacity to derive and mobilize its experience with the same kind of embedding in the intrinsic nature of the created order.

Now connect the *Qur'anic* verses (42:38) with (42:49–53) to understand the derivation and social molding of knowledge with its causal evolution arising from the cognitive and experiential knowledge-induced world-systems. Here, the concept, methodology and the institutional molding of the process of knowledge formation in the *Shura* assume the central role. The *Shura* as a human and cosmic interactive, integrative and evolutionary medium of knowledge formation presents the discursive process. We will refer to this *interrelational* discursive interactive, integrative and evolutionary process of knowledge derivation from the divine epistemological premise of Oneness and its application to the conception and application in world-systems equivalently as the IIE-Process and the *Shuratic* Process.



### Characterizing the *Shuratic* process or the IIE-process

In the *Shuratic* process knowledge-flows are formed by:

- 1 the Will and Command of *Allah*;
- 2 the guidance or the *Sumah* of the Prophet Muhammad;
- 3 the guidance of the learned ones in accordance with 1 and 2;
- 4 enlightened discourses within and across communities (thus systems);
- 5 derivation of concepts followed by the development of ways and means, that is, instruments, policies and programs to institutionalize the unity of knowledge into the issues and problems of world-systems;
- 6 continued evolution of the experience of unity of knowledge through the relational sequences of 1-5 with respect to relational world-systems unified by the principle of complementarities, that is, pairing across diversity of issues and problems and classes of world-systems;
- 7 the closure of 1-6 with the ultimate accumulation of knowledge which occurs in the *Akhira*. This complete passage closes the universe in its very large scale through the function of the microscopic world-systems cumulatively describing the entire world-system.

The uniqueness of the IIE or *Shuratic* methodology in all issues and problems of world-systems is recognized by the pervasive complementarities in relations between knowledge-induced entities using the same explanatory methodology of unity of knowledge. While the relations remain embedded in the cosmic order, they are unraveled by the conscious human mind by organizing the unity of knowledge, that is, the relational orders in the world-systems.

The principle of knowledge according to the *Qur'an*, being uniquely embedded in divine Oneness, is distinct from a cursory reference to rational knowledge. The latter category neither precedes, nor is it independent of, divine knowledge, *Tawhid*. Thus there is no "knowledge" other than the *Tawhid* inspired knowledge of the unity of life, thought and action. The discursive process of knowledge formation thus commences from the *Qur'an* and is ratified by the *Qur'an*. This is the self-referencing methodology that is so discursively different from the refutation hypothesis in Western thought. Shah Waliullah (trans. Jalbani, 1985, p. 67) expounded the method of self-referencing in his commentary on the *Qur'an* (modified by author):

Two, three or more aspects of this science of commentary (of the *Qur'an*) have been poured into my mind from the ocean of divine grace. If you were to ask me the right thing, then let me tell you that I am a student of the *Qur'an* without any intermediary, an *Uwaisi* (follower) of the Holy Prophet, and have benefited, without any mediation, from the *Kaba* of goodness (*Allah*) as have I benefited myself without any intermediary from the Holy Prophet.

### Rejection of rationalism in the *Tawhidi* worldview

Rationalism is the claim on knowledge in relation to an infinitely endless human discourse born of dialectical process that has no beginning or end. Some such open-ended ideas of knowledge are found in Popper's (1988) refutation theory regarding the inability to know, Marx's dialectical materialism (trans. Resnick and Wolff, 1987), Kant (Paton, 1964; trans. Friedrich, 1977), Hegel's (trans. Sibley, 1956) open-ended discursive universe and the social Darwinism of interaction followed by conflict and independence of the natural selections (Darwin, 1936).

In Kantian thought, Rationalism is manifested by the problem of heteronomy, that is, in terms of autonomy between the pure and practical reason. Between these two domains of the mind the possibility to synthesize God with reason by a continuous self-referencing and discursive logic remains absent. There is no methodological possibility to bridge this gap of synthesis in Kant's dichotomy between pure and practical reason. Heteronomy as a problem of lack of synthesis between pure and practical reason was pointed out by Carnap (1966).

The *Qur'an* refers to Rationalism as falsehood or meaningless speculation. On it, therefore, no truth and certainty can be premised. In this regard, the *Qur'an* declares (51:3-11), "Truly you are in a doctrine discordant, through which are deluded (away from the Truth) such as would be deluded. Woe to the falsehood-mongers, - those who (flounder) heedless in a flood of confusion."

Contrarily, the epistemology of unity of knowledge as the continuing sensation in the relationship, "*Tawhid* to the world-system through the process of the consciously knowledge-induced world-systems," as explained earlier, establishes the discursive process given by the conditions (1)-(7) mentioned above. This is the assertion of the methodology of self-referencing in the *Qur'an* against falsification in Rationalism. In this regard, the *Qur'an* says (42:53), "The Way of Allah to Whom belongs whatever is in the heavens and whatever is on earth. Behold (how) all affairs tend towards Allah!"

The discursive learning process generated by the Signs of *Allah* premised on the phenomenon of unifying "pairs" and evolving therefrom to ever higher faculties of knowledge like a tree (*Shajaratul-Taiyyabah* of Chapter 14 of the *Qur'an*, *Ibrahim* or *Shajaratul-Mubarakah* of Chapter 24, *Light*), delineates the coterminous ordering of the three fundamental essences of unity of knowledge in the flow form. These are: interaction signified by discussion across all world-systems; integration marked by "pairing" or complementary interrelations that now take shape and form in the order of knowledge-flows as attained during the interactive process; growing into ever-higher springs of knowledge of this divine confirmation (re-origination of *khayal in-jadid*). The stage of *khayal in-jadid* marks the knowledge evolutionary process of confirmation, certainty and further knowledge acquisition, inducing higher orders of the world-systems.

The *Shurati* process of deriving unity of knowledge and also recognizing and rejecting the ignorance of unity is the incessantly coterminous movement of these three fundamental aspects of knowledge-flows as derived from the *Qur'an*. Note how the deductive and the inductive roots of knowledge are circularly combined in the *Shurati* process or the IIE-process through continuous interrelations in the knowledge fields of essence and forms. In this regard, the *Qur'an* says (29:19), "See they not how Allah originates creation, then repeats it: truly that is easy for Allah." Also, there is the verse (30:11), "It is Allah Who begins (the process) of creation; then repeats it; then shall you be brought back to Him." To the rationalists who rest knowledge on individualism and conflicting discourse on dichotomous claims, is posed the following question (10:34): "Say: 'Of your "partners," Can any originate creation and repeat it?' Say: 'It is Allah Who originates creation and repeats it: Then how are you deluded away (from the truth)?'"

### Pairing geometrical points in the knowledge-induced space

I return now to my geometrical point in the midst of the *Qur'anic* consciously learning universe in which the point pairs with so many other ones by the essence or *Fitra* of unity of knowledge in life, actions and recursive experience through unraveling (*bayanah*) and abstraction (*ghayb*). The fecundity of pairing in the experiential and cognitive world-systems is exemplified by the *Qur'an* (2:261) in terms of a grain of corn yielding multitudes of grains thereof.

The continuous pairing and evolution every time, incessantly co-determines the three properties. First, there is interaction marked by discourse on the basis of complementary relations across diversity of experiences. This stage leads to the second stage, which is the establishment of complementarities in diverse systems. The complementarities are the causation of unity of "pairs." We term it as integration. Hence, the stage of integration is one of attaining complementary interrelations out of interacting or learning "pairs" in diverse experiences. The third stage is the emergence of repeated experiences of the first two stages, that is, of interaction and integration, and this occurs in continuum. An evolutionary knowledge-field of continuously recursive learning and cognitive construction emerges. The *Qur'an* refers to this evolutionary process of gaining unity of knowledge as *khulq in-jadid*, mentioned above.

This totality of experience of the *Qur'anic* world-system by the IIE-process is reflected in the relationship, "from *Tawhid* (Primal) to the World-System (*Alameen*) to *Tawhid* in the Hereafter (*Akhira*)."<sup>2</sup> Such an overarching relation defines the *Qur'anic* theory of knowledge. It is a permanent truth of the straight path of continuous learning premised on the Oneness of Allah. The relation is referred to as *Sirat al-Mustaqim* and is substantively explained in the *Qur'an*.

The *Sirat al-Mustaqim* appears as the straight path (*Qur'an*, 1:6). It takes the meaning of light of the Heavens of the Earth as the knowledge that Allah has bestowed (Chapter 24 on Light, *Nur*). It gives the meaning of the reality of coming from and returning back to Allah (*Qur'an*, 42:52) in the sense of the creative totality. It gives the meaning of balance and stability in creation (*mizan*). It gives the meaning of the incorruptible source of truth and certainty (*Qur'an*, 6:153). In the meaning of the interactive, integrative and ever evolving tree of knowledge the *Sirat al-Mustaqim* is given the meaning of intertwined richness of knowledge that marks complexity within unity in Chapter 14 (*Ibrahim*). Thus, in the total knowledge-centered worldview the *Sirat al-Mustaqim* is explained by the following verse (47:1): "Nun. By the Pen and by the (Record) which (men) write, . . ."

### Reverting to the contrast between Islamic and other worldviews in economics

Once again, we take stock of the knowledge-centered world-system and the experience of the learning elementary point now in the midst of its pairing world of economics. In terms of mainstream economic thinking, economic rationality says that the geometrical point attains full information, even though this may be within a bounded rationality set of resource allocation. With full information the point attains an optimum.

### Conception of equilibrium and optimality in mainstream economic theory

Such an optimal full-information point can be generalized to many criteria in mainstream economics, all of which share the same properties of information fullness and non-learning end points. Examples are the prototype of the "point" representing the surface that denotes the consumer indifference curve. Hence, the coterminous functional concept is optimal utility. Likewise, the optimal "point" can represent the surface of a production possibility curve. Then, the coterminous concepts are optimal output, optimal revenue and optimal profit. Also, the production isoquant is the surface replacing the production-input "point." Coterminous derivations are optimal factor productivity and factor allocation. The optimal social welfare surface replacing the "point" is linked with optimal allocation of public goods. One can continue on with similar concepts of optimal debt, optimal economic policies, optimal savings and so on.

In every one of these citations, the one-to-one relationship between economic rationality premised on full information and economic competition, results in scarcity and individualism of the agents. These, in turn, translate into the unique principle of "marginal" substitution between competing alternatives. In the resource allocation case, the neoclassical concept of Pareto-optimality, defined as an attained optimal point that cannot be



changed without making anyone worse off, results in competition between alternatives. Examples of such alternatives are competing goods, labor and capital, competing social groups in society, political opponents, oppositely moving fiscal and monetary policies. The concept of optimal savings in the financial sector is used to generate optimal capital accumulation. Now interest rates substitute productive returns of the real sector. Hence occurs substitution between money and the real economy. Likewise, optimal trade policy results in marginal substitution between import-substitution and export-orientation, between growth and distribution, and so on.

In each of the above cases the multiple "constraints" as relationships between variables to enable the attainment of the optimal points and surfaces comprising these substituting opposites, contain intersecting relations that remain fixed under the assumption of full information or bounded information. Such optimal points and surfaces can then be thought of as having ended their learning character. Besides, there is no prescription in such formulations to explain how a *process* model can be formalized that can lead a learning point into the equilibrium and optimal states. Learning and innovations have ended at such optimal and steady-state equilibrium points, both in the static and the time-dynamic case (Shackle, 1971).

On the contrary, let us consider the character of the continuously learning point and surfaces of the *Qur'anic* universe. In this relational and pervasively complementary universe, the point is one of many in its paired community (*umamun*). As it interacts, integrates and evolves by recursive interrelationship with other points and surfaces, the emergent co-planar variables of the geometrical relations as "pairs" with the other co-planar points, learn and evolve under the force of a continuous generation of the knowledge-flows. The *Qur'an* refers to this phenomenon of re-origination out of pairs among many by the term *fatara* (*Qur'an* 35:1). The process of re-origination gives freedom to the learning and "pairing" points and surfaces to evolve by the principle of knowledge-induction and creative evolution (*khalq in-jadid*).

Consequently, the momentary "optimal point" governed by Pareto-optimal conditions is continuously evolved under the force of knowledge-flows. The result is the production of a continuous flow of opportunities that enable complementarities to sustain themselves across the increasingly relational universe. The potential growth trajectories, the resource allocation line, prices, preferences, etc. are not predetermined in any way. Instead, they are evolved under the force of knowledge recursion within, and between, the attained socio-economic variables and their circularly causal relations, as was explained earlier. The attained optimal points and surfaces in the momentary sense are subsequently evolved and scattered around the attained points, and any terminal condition of learning and independence of the relationships between variables are negated. A complex system of circular interrelations between the "pairing" points and the agents takes place. The IIE-nature of the consciously learning universe is thus fully

realized in the framework of the unity of knowledge as derived from the *Ta'uhidi* premise. In this regard the *Qur'an* says (59:24), "He is Allah, the Creator, the Evolver, the Bestower of Forms (or Colours) . . ."

### **Generalization of the knowledge-centered methodology in the conscious world-system**

We will now generalize the experience of our elementary creative point to an entire set of learning points and surfaces. The question posed in this regard is this. What happens to the undetermined Lagrangian parameter and the Hamiltonian coefficients in the context of dynamic optimization? See Intrilligator (1971) for these technical terms. Because of the shifts in the knowledge-induced variables and their relations and the intersecting co-planar surfaces, the coefficients, too, get induced by the emanating knowledge-induction in the sense of the IIE-process, and this occurs in continuum.

Consequently, what happens to the so-called Pareto-optimal points of resource allocation? The Pareto-optimal points experience perturbations and this thwarts the possibility of an optimum to exist, except in the most instantaneous case, which, though, is of no interest in the consciously learning universe. The result is devastating for neoclassical economics and its entire prototypical developments. We note that none of the so-called "optimal surfaces" and their functional criterion, and hence the underlying system of "constraints," can logically exist.

Let us change the question to yet another one. What if there are many such Pareto-optimal points from which a limiting value can be chosen, as in the case of the semi-continuous property of upper and lower bounds given in Debreu's *Theory of Value* (1959)? One notes that such a limiting point is, itself, the consequence of learning in "pairs" and is, therefore, of the evolutionary nature embedded in a consciously learning world-system governed by the IIE-process methodology. Shackle (1971) explains such a problem effectively by pointing out that the impossible idea of attainment of a market-equilibrium point is equivalent to the lifetime computation of all the invisible exchanges that go behind this market equilibrium. Furthermore, the market equilibrium, being a derivation from the basic concept of consumer equilibrium, is determined by predetermined consumer preference and their underlying optimal utility functions in goods existing as marginal substitutes. Now, since consumer preferences are subjectively determined, there is no explanation here on how the market equilibrium can be treated as an objective criterion.

Let us continue the question surrounding the Pareto-optimal nature of equilibrium and resource allocation. What if we say that the set of Pareto-optimal points constitutes a stochastic topology and is thus subject to random variations? Once again, in this case, a mathematical optimization problem needs some kind of a random walk model or a stochastic process.

An example is the Markovian stochastic process used in econometric modeling to arrest the problem of interdependence between the random residual variables called autocorrelation. See Vanmarcke (1988) for technical details. Another example is the adaptive model of rational expectations hypothesis used to recursively arrive at an equilibrium value of the price and money variables (Minford and Peel, 1983). In all such variants of methods, a bounded rationality assumption is, once again, invoked.

In all cases we note that, since the evolution of the neoclassical surfaces assumes long-run condition to prevail, therefore, time becomes an independent variable in projecting the repetitive neoclassical nature of predetermined preferences, production and consumption menus over time. Consequently, from one surface to another of such an independently determined time-dynamic movement of the economic menus there can be no structural change. Structural transformation is, thus, benign in neoclassicism. Consequently, policy and institutions remain exogenously determined by predetermined preferences, menus and functions.

The absence of structural transformation in the neoclassical economic universe governed as it is by competition, resource allocation, optimality and steady-state equilibrium as conditions of economic rationality and computed by the marginal substitution formula, is the permanent methodological feature.

Thereby, one notes that the neoclassical principle of the marginal rate of substitution and its related implications remain permanently opposite to the principle of pervasive complementarities in the Islamic world-system. We must emphasize here the meaning of pervasively complementary relations premised on the unity of knowledge within and across systems, as opposed to the limited complementary relations between certain goods in the neoclassical economic universe. In the latter concept, bundles of complementing baskets eventually break apart as competing ones with other baskets. The principle of limited complementary relations thus reverts the neoclassical economic universe to marginal substitution once again.

These behavioral aspects of neoclassical economic theory are contrary to the *Qur'anic* principle of resources and resource allocation. The *Qur'an* holds that resources are truly abundant in the universe for the sustenance of all, if they are consumed, used, reused and produced in moderation with God-consciousness being embedded in the human ecological awareness established by the principle of pervasive complementarities. Thus, this principle premised on abundance and sustainability of resources for the wellbeing of all as used and produced with the proper instruments of unity of knowledge within and across complementary systems, prevails. The principle of pervasive complementarities, thus, totally replaces the marginal substitution principle of neoclassicism and its prototypes. This conclusion is true for both the natural sciences and social sciences of the Islamic world-system versus mainstream thought.

## The intellectual predicament of Islamic Economics

Over the last fifty years or so, certain groups of Muslim economists coined the term Islamic Economics for a discipline that tries to integrate Islamic values with neoclassical methods and its prototypical developments. Almost all of the tenets of neoclassical economic theory, including its core principle of marginal substitution and, consequently, all the neoclassical objective criteria, policies, behavior, institutional norms and thought have been transported into Islamic Economics. Upon this, certain Islamic values have been exogenously introduced to explain economically rational behavior.

### Pareto-optimality in Islamic Economics

The concept of Pareto-optimality is taken up simply in its definitional, rather than in the analytical, context relating to the nature of resource allocation. This line of development in Islamic Economics marginalized any fresh demand in it to answer subtle questions of the complex relations between ethics, values, markets, policies and institutions in the framework of unity of systemic knowledge. The epistemological derivation of a new body of thinking with a universal appeal remained outside the domain of such a neoclassical treatment of Islamic Economics.

In the IIE-process methodology premised on *Tawhid* the rejecting of the Pareto-optimal concept of optimality and equilibrium that continue to play a major role in Islamic Economics poses a fundamental question: What is the alternative concept of optimality and equilibrium advanced by the knowledge-centered methodology of the *Tawhidi* epistemology? The *Qur'an* (27:7) is, indeed, the book of Balance, which is an overarching sign of equilibrium. It is the book of Knowledge (*Iqra*) (96:1-5). It is also the book of the completion of knowledge in the divine writ (*Lauh Mahfuz*) (85:22). These attributes of the *Qur'anic* worldview must be interrelated to explain the subtle *Qur'anic* conception of optimality and equilibrium in the "paired" universe.

### Conception of equilibrium and optimality in the Qur'anic world-system

Besides, in the sense of the very large-scale closed universe implied by the overarching relationship earlier mentioned, namely, "*Tawhid* to *Tawhid* through the process of the knowledge-induced world-systems," there must necessarily exist stable equilibrium along this path of the *Sirat al-Mustaqim*. Consequently, every sub-set of this total large-scale universe is also governed by the topology of this stable equilibrium. Except now that, in the creative evolutionary sense, the continuously and recursively interactive and integrative processes lead to evolutionary equilibriums along the "straight" but complex path of knowledge-induced evolution. These lead to important



implications relating to a combination of results taken from Fixed Point Theorem (Nikaido, 1989), the evolutionary equilibrium theorem (Osborne and Rubinstein, 1994) and the unbounded set of evolutionary equilibrium points (Choudhury, 1993a). We are, therefore, not questioning the reality of optimality and equilibrium as such, but simply the nature of such concepts and their analytical measurements in the knowledge-centered world-system, where continuously creative dynamics replace both steady state and static conditions of optimal resource allocation, despite the interjection of time.

On optimality, stability and equilibrium in the knowledge-centered universe the *Qur'an* declares (41:10–11):

He set on the (earth), mountains standing firm ... bestowed blessings on the earth, and measured therein all things to give them nourishment in due proportion in Four Days ... Moreover He comprehended in His design the sky, and it had been (as) smoke: and He said to it and to the earth: "Come you together willingly or unwillingly." They said: "We do come (together), in willing obedience."

Indeed, none of the verses of the *Qur'an* can be fitted into the mental construct of a received rationalist philosophy of science for conformity. Rather, the *Qur'an* is an independent text of truth in itself. Upon this, all sciences are to be checked out and the prevailing knowledge-centricity of the *Qur'an* substantially understood and constructed as the Islamic worldview.

The uniqueness, strength and superiority of the independence of the *Qur'an* give it the stability and invincible permanence over unbelieving ignorance (*Jahiliyyah*). This power reflects the sure sign of its certainty and completeness of knowledge. The point is noted in the verse (8:65): "O Apostle! Arouse the Believers to the fight. If there are twenty amongst you, they will vanquish two hundred ... of the unbelievers: for these are a people without understanding." Furthermore, there is the verse (48:28), "He it is Who sent His Messenger (Muhammad) with guidance and the religion of truth (Islam), that He may make it (Islam) superior. And All-Sufficient is Allah as a witness."

In the light of the above invocation in the *Qur'an* it is, therefore, the conception, methodology and different methods of understanding optimality and equilibrium within the process-oriented framework of the *Tawhid* worldview of unity of knowledge and experience that spell out the deep distinction with all the rationalist understanding of optimality, stability and equilibrium. The *Qur'an* has bestowed the universe with an optimal equilibrium and stable order in the framework of the divine laws, *Sunnat Allah*. The permanence of the divine laws, *Sunnat Allah*, is established by the equivalence of *Tawhid* with the terminal event of the Hereafter in terms of the equivalence of the stock of divine knowledge. In this regard, the *Qur'an* declares (48:23): "That has been the Way of Allah already with those who

passed away before. And you will not find any change in the Way of Allah." Here is also the implication of the stable and equilibrium states gained from the certainty of the divine law (*Tawhid*) over the total life of the universe in space and time. That is, *Tawhid* pervades the *Qur'anic* meaning of historicism as the proof of divine Oneness in action within and across the order of change with certainty, stability and balance rooted in the only truth, that of the Oneness of Allah.

We are incited here to point out the structural and functional aspects of the methodology and methods for conceptualizing and applying the optimum, stability and equilibrium concepts in the *Tawhid* precept of the interactive, integrative and creatively evolutionary worldview. There is no simple and unique answer here. That is because of the freedom bestowed on the observer to explore the diverse phenomena in the conscious and unified worldview and, thereby, to follow the command to learn the universe in the framework of unity.

In this study, as elsewhere (Choudhury, 1995), I have referred to the mathematical topological method with perturbations at the re-origination points of the recursively learning circular causation model of the IIE-process vintage. The result is a system of guided and evolutionary equilibriums across multiple evolutionary optima that continuously learn and evolve according to the *Shuratic* process. Consequently, simulation models instead of optimization models are found to be more appropriate methods of analysis to comply with the epistemological methodology underlying the continuously evolving universe according to the *Tawhidi* worldview (Choudhury and Korvin, 2002). In the case of simulation addressing knowledge evolution in the *Tawhidi* world-systems, knowledge-endogenous circularly relational systems are to be used, instead of the exogenously predetermined preferences, menus, technology, policy, institutions, organizational structures and coefficients of neoclassical economic theory, that rest on the axiom and properties of Pareto-optimality.

### Contemporary emergence of evolutionary analysis in economics and science

The evolutionary knowledge-dynamic methodology and the concomitant methods are only now entering the realm of highly analytical research. I cite here a few. Knowledge-induced dynamic input-output coefficients have been used, emulating the learning coefficients of the circular causation system of sectoral linkages (Choudhury, 2003). Evolutionary game theory with interrelated payoffs different from the Prisoner's Dilemma game or co-operative game-theoretic methods are used by Osborne and Rubinstein (1994), and Choudhury (2000). Chaos, fractal and tensor spaces of comovement of continuously learning relations have been used in explaining complex socio-scientific behavior (Prigogine, 1980; Choudhury and Korvin, 2002). A criticism of the concept of market equilibrium and its formulation

in economic theory, is given in the insightful works of Shackle (1971) and to a limited degree by Herbert Simon (1987). In the field of quantum mechanics, the Heisenberg Principle of Uncertainty points to the perturbation phenomenon of non-optimal and non-steady interaction between the incidence of light and the fundamental particles at the micro-cosmic level (Kafatos and Nadeau, 1990).

The great Islamic contribution to the theory of knowledge in a discursively learning universe of unity of divine knowledge, was made by Imam Ghazzali (Ghazzali, trans. Marmura, 1997). See also Ghazzali's *Niche of Lights* (Ghazzali, trans. Buchman, 1998). The topic of *Tawhidi* topology and its relationship with timal topology is developed in the six volumes entitled *The Epistemological Foundations of Islamic Economic, Social and Scientific Order* by Choudhury (1995). A knowledge-driven simulation model, in contrast to the time-dynamic optimization model, was formalized by Choudhury and Korvin (2002). On the study of historicism by means of the *Qur'anic* conception of balance, stability and change, see Choudhury (2003). At a more mundane level, the circular causation method emanating from the underlying methodology of the knowledge-induced unifying interrelationships between inter-sectorally linked variables in the context of economic development has been studied by Choudhury (1993b). All these and many more are intended to point out the vast application of the *Tawhidi* worldview in terms of the IIE-process methodology (same as the *Shuratic* process) applied within, and across, continuously learning world-systems (Barrow, 1991; Wallerstein, 1998).

### **The predicament of Islamic economics in relying overly on the *Fiqh* literature (interpretation of the prophetic sayings by the Ulemas)**

The predicament of Islamic Economics is also based on its over-reliance on traditional interpretation of the *Hadith* literature (sayings of the Prophet Muhammad) (Azami, 1978). This approach has caused the traditionalist method (*Fiqh*) to be marred by a non-systemic treatment of the *Tawhidi* worldview of unity of knowledge in deriving the rules referred to as *Ahkam* (Al-Alwani, 1991). Yet the *Qur'an* singles out the essential requirement for the *Tawhidi* reference in the understanding of every *Hadith*. This criterion, indeed, is an essential check on the authenticity of a *Hadith* and must play a central role in the formalism of the *Shuratic* process. Therefore, all categories of issues, problems and their analysis are to be pursued within the essential reference to the *Tawhidi* worldview *prima facie*.

In this work and elsewhere, the core methodology has been formalized in terms of the *Tawhidi* worldview and functionally developed by the IIE-process model. All issues and problems are, thus, taken up within the characterization of the "straight" but complex path, the *Sirat al-Mustaqim*, and delineated by the relationship, "*Tawhid* to *Tawhid* through the process

of the knowledge-induced world-systems." This is a perfectly integrated and closed relation. Thus, according to it, an analysis of any issue or problem cannot commence from the material world-system without eventually re-establishing the sequential relationship between unity of knowledge and the emerging knowledge-induced world-systems, as explained earlier. In regard to the fundamental requirement of an authentic *Hadith* to be in strict conformity with the *Qur'an* there is the verse (53:3-5), "Nor does he (the Prophet Muhammad, SWA) say aught of his own desire. It is only a Revelation revealed. He has been taught (this *Qur'an*) by one mighty in power [Gabriel]."

The above argument points out that any *Hadith*, such as the *Madinah Hadith* (on date cultivation) used by some Islamic economists to defend their neoclassical leaning on economic rationality and free choice, does not have an Islamic relevance without that *Hadith* being first tested within the *Qur'anic* (*Tawhidi*) context. Second, the test must be formalized in order to be functional. Otherwise the rule developed remains non-systemically applied, and can bear no systemically endogenous relevance in the socio-scientific order. This requirement otherwise is essential for the construction of the knowledge-centered worldview.

Rationalism prompted by *Fiqh* interpretation and individual rationality then negates the essential *Tawhidi* relevance. The *Qur'an* (51:7-11) warns the rationalists against their speculative forays: "By the Sky with (its) numerous Paths, truly you are in a doctrine discordant, through which are deluded (away from the Truth) such as would be deluded. Woe to the falsehood-mongers, - those who (flounder) heedless in a flood of confusion ...". The Prophet Muhammad said that any good work that was done in life not in the name of *Allah* would not be acceptable to *Allah*. Also the Prophet said that if a person dies invoking anything else but *Allah* that person will be damned in Hell. The Prophet also said to his companions when in Muzdalifah (near Makkah) after a Pilgrimage (*Hajj*), that of those who said that the rainfall that morning was because of such and such stars, they have turned to the camp of the unbelievers. On the other hand, those who say that it was due to *Allah's* command, they are in the Mercy of *Allah*.

The predicament of Islamic Economics is its subservience to rational choice within the borrowed context of received economic thought. The so-called Islamic economists have failed to premise rational inquiry on the premise of the epistemology of *Tawhid*. Consequently, no fresh demand and challenge could be launched by this variant of the neoclassical school.

On the essential place of epistemological reasoning in Islamic thought and action Imam Ghazzali wrote in his *Tahafut al-Falasfah* (Ghazzali, trans. Marmura, 1997) regarding three kinds of believers being judged by *Allah* in the Hereafter. The first one invoked speculative philosophy as of the Greeks to tie up the *Qur'an* and *Tawhid* to it. Ghazzali said such people would enter Hell and only after *Allah's* pardon would they be sent back



to Heaven. The second kinds are those who worshipped *Allah* in the ordinary and simple straightforward way without invoking the *Tawhidi* episteme in their life and action. Ghazzali said such people would enter Heaven. The third kind comprises those who actively invoked the understanding of *Tawhid* by epistemological inquiry and applied that Light of *Allah* (*Allahu Nur as samat wal arid*) (*Qur'an* 24:35) in their lives, thoughts and actions. Ghazzali said these would be the ones who would abide in the highest heavens with the prophets and the highly blessed believers (*Anbiyyas*). The *Qur'an* refers to the last category of deep believers by the term People of the Right (*al ashab al-maimana*) as against the People of the Left (*al ashab al-masha'ima*). Above all these will be the supremely faithful (*sabiqun*) (*Qur'an* 56:8–11).

The rationalist predicament of socio-scientific theory that has been effectively imbibed by Islamic Economics fails to answer the following questions. In fact, there is no available methodology in the neoclassical economic theory, Pareto-optimality being an example, to address such questions.

- 1 In reference to the creative point that continuously learns in the relational world-system of unity of knowledge, can neoclassicism define its optimality and equilibrium concepts, and thereby, the entire neoclassical idea of resource allocation in terms of a precise measure of statistically "expected" relative pricing and thus markets, exchange, efficiency and welfare?
- 2 Can neoclassicism as guided by the optimal-equilibrium allocation frontier, cause endogenous evolution of such frontiers by the force of learning and still keep the surfaces smooth and intact over the long run?

### Elements of the polity-market interaction in the *Tawhidi* world-system

As opposed to the limited vision and application of economic theory, the *Tawhidi* praxis of unity of knowledge in a conscious world-system, remains unique and clear, yet substantive and complex with richness. The IIE-process methodology explains the knowledge-induction and its structure, function and change. But it also explains the structure, function and change of "de-knowledge" (rationalism, falsehood) in a terminally optimal universe that limits novelty and creative evolution. The problem of neoclassicism is tackled by the IIE-methodology by holding its conscious menus of creative change at an instantaneous non-learning state. The universality of the *Tawhidi* worldview in explaining both unity of knowledge and de-knowledge in world-systems is thus established. In regard to the universality of the *Tawhidi* praxis, the *Qur'an* declares (2:115): "To *Allah* belong the East and the West: Wherever you turn, there is the Presence of *Allah*. For *Allah* is All-Pervading All-Knowing."

The very implication of consciousness here is that resource scarcity is removed by the responsible conduct of consumption, production and distribution. The behavioral attributes of the *Tawhidi* social space necessitate specific ways and means to actualize the socially responsible behavior. In the *Shari'at* process as explained earlier, extensive interaction within, and between, the human, animate and inanimate worlds and the development of ethical conduct of discourse, consensus and onwards evolution from, and toward, an ever-increasing consciousness of *Tawhid*, causes knowledge-induced transformation of dynamic preferences. In this process of interactive preference transformation leading to integration and creative evolution, a circular causality exists between the individual, groups, community, institutions and the environing political entities. The preferences are thus transformed into participatory ones and these play the central behavioral role in defining the consumption, production and distributional menus. The preferences learn by feedback between the polity and the market in terms of the interrelationships generated by the circular causation feedback.

The effectiveness of the dynamic preference change is gained by using the IIE-learning process with continuous effort to search for newer ways of attaining higher levels of systemic unity. Discourse and instruments of participation, co-operation, sharing and spending, as opposed to saving and withholding resources, engenders the possibilities for fresh technology conformable to the level of development attained. The cost control in this process of co-movement between the knowledge-induction of agents, institutions and the economy is attained by the diversification of possibilities along lines of adaptive development regimes. Elsewhere, we call such development regimes, moving under the force of knowledge-induction and diversity, the dynamic basic needs regimes (Choudhury, 1989). Anthony Giddens (1983) refers to such a co-determined movement process as the power of "presencing" and treats it as the essential nature of modernism.

The experience of diversity (interaction) is harnessed into complementary interrelations (integration) between resources, markets, technology, social and economic menus, polity and agents, which then evolve along the path of continuous pairing of the possibilities (creative evolution). The meaning of abundance unleashed by responsible conduct is understood and formed in this knowledge-centered worldview. Polity-market interaction is, thus, neither an enforced, nor a wishful, goal. It is, rather, a naturally motivated and guided experience of endogenous participation, rules and transformation of dynamic preferences out of unity of knowledge. The polity and its market participants take stock of the instruments, policies and programs of participation and co-operation to put into effect the circular causation feedback of learning in diversity with consensus and balance.

With respect to the essential character of the conscious polity and the agents in the environing world-systems, the *Qur'an* declares on the attributes of their agents (3:104–105):

Let there arise out of you a group of people inviting to all that is good (Islam), enjoining *Al-Ma'uf* (Islamic monotheism and all that Islam orders one to do) and forbidding *Al-Munkar* (polytheism and disbelief and all that Islam has forbidden). And it is they who are the successful.

And be not as those who divided and differed among themselves after the clear proofs had come to them. It is they for whom there is an awful torment.

On the attributes of the conduct of affairs in polity and the environing systems the *Qur'an* states (4:59):

O you who believe! Obey *Allah* and obey the Messenger (the Prophet Muhammad), and those of you (Muslims) who are authority. (And) if you differ in anything amongst yourself, refer it to *Allah* and His Messenger, if you believe in *Allah* and in the Last Day. That is better and more suitable for final determination.

On the interrelationship between the individual and the Islamic community and global order as the highest order of Islamic polity and socio-economic relations the *Qur'an* declares (2:143):

Thus We have made you [true Muslims – real believers of Islamic monotheism, true followers of the Prophet Muhammad and his *Summah*, legal ways] a just (and the best) nation, that you may be witnesses over mankind and the Messenger a witness over you.

The endogenous (that is, inter- and intra-systemic causation) polity-market interrelationship is pointed out in the following verse (62:9–10):

O you who believe! When the call is proclaimed for the prayer on Friday, come to the remembrance of *Allah* and leave off business. That is better for you if you did but know.

Then when the *Jumu'ah Salat* (prayer) is ended, you may disperse through the land and seek the Bounty of *Allah* and remember *Allah* much that you may be successful.

The endogenous relationship between markets and prayer is established in the circular fashion of interrelationship between the normative aspect of faith and the positive aspect of the markets and livelihood governed by the bounties of God. The market is seen as a system of exchange of knowledge-induced goods and services.

### Methods premised on comparative methodologies

The methods of scientific analysis are deeply influenced by the underlying episteme of the corresponding system. By methodology we mean the

analytical implications of the episteme. In neoclassical economic theory with its axioms of economic rationality, predetermined preferences and the behavioral aspect of individualism, all decisions are characterized by the episteme of this school of thought. Corresponding to that episteme is the logically entrenched principle of marginal substitution between competing alternatives. Upon this episteme and the principle rest the set of methods derived and constructed to enable the neoclassical methodology to become analytically functional.

### Rejecting the time value of money in Islamic asset valuation

An important method premised in the neoclassical methodology of marginal substitution is resource allocation and its intertemporal discounting by the "time value of money." Time value of money is the valuation measure in the present worth of a future stream of financial prospects. All future transactions capitalized by the time value of money must depend upon a number of predetermined assumptions that must prevail over time and contingencies, be these state variables or policy variables. Future markets wherein transaction will take place in terms of the neoclassical axioms governing economic rationality, predetermined preferences and the time preference cost for deferred payment of financial returns, must prevail at every point of time and with respect to all dated goods (Hirshleifer, 1970). Thus price, quantity and specification of exchange are predetermined values. The uncertainty of future transactions is measurable by statistical expectation and adaptive stochastic models. There is always a cost for money delayed for payment over time which, in the parlance of time value of money, is the rate of interest. The future must, thus, be fully determined or measurable by probability measure to enable present valuation of the stream of future transactions.

Yet, the fact of the matter is that the future can neither be predetermined nor capitalized by assumed probability expectation. One cannot be sure of the existence of specific markets in terms of the demand and supply conditions of exchanged goods. Valuation, even in one so-to-say stable financial market, is sure to turn into imprecision due to volatility in multi-markets linked to that specific market. Thus, the uncertainty of contingency and the nature and valuation of goods and resources flowing over time, are impossible to set ahead of their actual occurrence. Therefore, how can a certain discount rate be assigned for capitalizing returns from future transactions, the value of which is collected at the present time?

Thus, whether in stable or unstable future markets, and independently of the nature of the goods, durable, perishable or financial, the discounting of future cash flows results in inexact valuation of such assets. The present capitalization of future risk is always exaggerated. Hence, the discount rate is always positive. This positive discount rate cannot be linked to any



measure of actual productivity in the absence of full knowledge of the future transaction. Such a price on deferred cash flows without its link with real productivity is called *Riba* in Islam.

The concept of *Riba* as interest has certain distinct features. The quantity measure of the rate is irrelevant to the *Riba* rule. *Riba* as an excess can exist for both financial transactions and exchange of similar goods in unequal quantities. The saying of the Prophet Muhammad with regard to the *Riba* rule is this (quoted from Ismail, 1989, p. 374):

Exchange of gold with gold is *riba* unless it is done on the spot in equal quantities; exchange of silver with silver is *riba* unless it is done on the spot in equal quantities; exchange of wheat with wheat is *riba* unless it is done on the spot in equal quantities; exchange of salt with salt is *riba* unless it is done on the spot in equal quantities.

The *Qur'an* says about the necessary condition for direct link between valuation and money in the story of the Cave Men who, when they woke up after many hundreds of years, were given some silver coins and asked to buy some good sustenance in the market place. In other words, the silver coin as currency was not augmented by an increase to enable the purchase of life sustenance after so many hundreds of years. Rather, an exact valuation of the silver coins with the purchased goods at the time of their re-awakening was considered as the proper measure of the financial worth of the money in terms of the spending in the real goods. In this regard the verses of the *Qur'an* are (18:19):

Likewise, we awakened them (from their long deep sleep) that they might question one another. A speaker from among them said: "How long have you stayed (here)?" They said: "We have stayed (perhaps) a day or part of a day." They said: "Your Lord (alone) knows best how long you have stayed (here). So send one of you with this silver coin of yours to the town, and let him find out which is the good lawful food and bring some of that to you."

The time value of money is, logically, a rate of interest on deferred cash flows. As a method, the time value of money must be avoided as an unacceptable method that does not conform to the methodology of the *Qur'an*. The *Qur'anic* injunction forbids interest-based transactions on grounds of either excess in financial or similar fungible benefits over time or of the absence of a precise valuation of any such kind of an asset in the absence of the money-real economy linkage, with markets being governed by the rules of the Islamic Law, *Shari'ah*.

Yet, by its reliance on neoclassical economic reasoning and the concept of Pareto-optimality, Islamic Economics has remained ambivalent to the epistemological conditions that forbid the discounting method and, thus,

the time valuation of money. The Islamic economists argue that, for certain goods transacted in stable markets, and for which conditions of preservation of value can be predetermined, the discounting method is permissible. The discount rate as the rate of interest is then replaced mechanically by an assumed rate of return. Yet, for this, no precise measure can exist for the same reasons of the future unknowns, as mentioned above.

Continuing on the same arguments in defense of the time value of money, Islamic economists legitimize the methods of present value and cost-benefit models of future cash flows. In this way, a whole domain of methods for empirical and analytical purposes have been borrowed by Islamic Economics due to its failure in incorporating methodological arguments of the *Tawhidi* worldview of unity of systemic knowledge which, in the case of asset valuation, is expressed by the direct productive linkage between money and the real economy at each point of time (Choudhury, 1997).

### **An asset valuation method in reference to the Tawhidi epistemology**

Upon taking recourse to the epistemological arguments and construction of the *Tawhidi* worldview, an important method of financial decision-making that uses the continuously polity-market discursive methodology based on the circular causation methodology of the *Shurati* or IIE-process, can be formulated. Such a model would bring out the essential interdependence between polity and markets revolving around the issue of the quantity of money in circulation to match up with the value of real economic transactions at a time. The method is equally grounded on an intergenerational resource valuation that reflects all the features of complementary relations across diversity of state and policy variables, and the diversification of risk and production (technology) by the medium of sharing of costs and benefits in projects recommended by the *Shari'ah* for attaining the goal of social well-being. These are substantive issues that we will take up in detail in this book. On a wider scale of endogenous ethical valuation, the polity-market linkages with regard to money-real goods linkages invoke all the characteristics of ethicizing markets under the force of knowledge-induced relations between the inanimate world-system of markets and the human response to that through circular causation. This marks the IIE-process taken up in the continuum of knowledge-induced evolutionary fields, now applied to the case of asset valuation.

The circular causation method of the IIE-processes underlying systemic linkages as the external manifestation of the *Tawhidi* unity of knowledge in formal systems, takes account of the feedback among a complex of factors. Among these are the human presence, the relational world-system comprising markets and polity, where economic, social, political and ethical factors prevail and interact, integrate and evolve. As mentioned above, while leaving out details for now, the forward overlapping generational

valuation method with contingencies arising from time-based polity-market discourses and actual occurrence of events, can be formalized as a valuation method that emanates from, and sustains, the *Tawhidi* essence of systemic unity. A later chapter is devoted to this topic.

### Methodological generalization in the *Tawhidi* worldview

The knowledge simulation system of circularly causal *interrelations* between the *Tawhidi* epistemology and the events of world-systems in the midst of the continuum of recursive *Shuratic* processes extending to the Hereafter, describes the functional methodology of the *Tawhidi* worldview as derived from the *Qur'an* and the *Sunnah*. The functional aspect of the *Tawhidi* methodology as expressed by the IIE-process remains unique in terms of its central principle of pervasive complementarities across diversity.

In this section, we will formalize that uniquely functional aspect of the IIE-process-oriented methodology and show how it is derived from the epistemology of *Tawhid* in the *Qur'an*. On the other hand, the choice of specific quantitative methods remains open by the very principle of unity in diversity. This would derive and conform such methods with the methodology of the *Tawhidi* worldview in issues and problems of all world-systems.

We will denote our earlier knowledge-induced geometrical point by  $P(\cdot)$ . It is configured in the following functional way:

$$P(\theta) = \text{knowledge-flows emanating from } T = \text{Tawhidi Knowledge} \\ = \text{Qur'an} \cap \text{Sunnah} = P(\theta, \mathbf{x}(\theta)),$$

where  $\mathbf{x}(\theta)$  is either a vector or matrix of complementary variables and their relations. The complementary relations is circularly caused by interrelationships between the  $\mathbf{x}(\theta)$ -variables and the recursively generated  $\theta$ -values.  $\cap$  denotes the mathematical intersection signifying consensus or conformity, hence integration.

In configuring the point  $P(\theta, \mathbf{x}(\theta))$  and the complementary relations generated between  $\{\theta, \mathbf{x}(\theta)\}$ , we note the following steps:

#### Epistemology

$$\Omega(Q, \text{Qur'an}) \quad (1.1)$$

#### Ontology

$$\text{Sunnah (as derived in accordance with the Qur'an)} \quad (1.2)$$

### Ontic or evidential entities

$\theta(T)$  (Reason (*Fitra*) derived by *Shuratic* discourse to sharpen the knowledge-flows regarding  $\Omega$  through the medium of  $S$ ):  $\theta(\Omega) = f(S(\Omega)) = (S \circ f)(\Omega)$ , which is the set of worldly knowledge of the learned in the *Tawhidi* epistemology (*ulul-unri minkum*). The symbol " $\circ$ " denotes compound relation.

The expression  $(S \circ f)(\Omega)$  denotes a functional understanding of  $\Omega$  in the light of  $S$  through discourse ( $f$ ). But since  $(S \circ f) = (f \circ S)$ , therefore a recursively confirming interrelationship exists between  $f$  and  $S$  in the understanding of the divine law, *Sunnat Allah* denoted by  $\Omega$ .

$$(S \circ f)(\Omega) = (f \circ S)(\Omega) \quad (1.3)$$

### The Islamic world-system

In accordance with the continuity property of knowledge-flows and their material induction, the creative geometrical point is actualized in its first stage. That is,  $P_1(\theta(\Omega)) = \{x_1(\theta(\Omega))\}$ .

$P_1(\cdot)$  now activates pairing in the light of the  $\Omega$ -episteme and the functional nature of  $\theta(\Omega)$ . This signifies the feedback from  $P_1(\cdot)$  to  $\theta(\Omega)$  in order to gain heightened knowledge of  $\Omega$ . This circular process causes the emergence of new creative points,  $P_2, P_3$  etc. in complementary relation with  $P_1$  by means of interaction at the level of  $\theta(\Omega)$ . Such a process of circular causation in evolutionary fields of knowledge-flows is generalized by the complemented point, now shown as a complementary knowledge-induced function,  $P(\theta(\Omega)) = \{\theta(\Omega), \mathbf{x}(\theta(\Omega))\}$ . From this sequence, taken over a range of interaction, comes about consensus in  $(\theta, \mathbf{x}(\theta))$  simultaneously between each other (pairing).

$P(\theta(\Omega)) = \{\theta(\Omega), \mathbf{x}(\theta(\Omega))\}$  can assume diverse functional forms. It can denote the social wellbeing (*Falah*) criterion function, which then takes the expression,  $W(\theta(\Omega), \mathbf{x}(\theta(\Omega)))$ . Such a social wellbeing criterion is then used as the measure of evaluating complementarities between the vector or matrix of the knowledge-induced variables,  $\mathbf{x}(\theta(\Omega))$ , when premised on the *Tawhidi* epistemology,  $\Omega$ .

$\theta(\Omega)$  denoting knowledge-flows experiences convergence to a consensual limiting point within a given *Shuratic* process out of many similar ones in continuum. Over the continuum of *Shuratic* processes, different levels of consensus based on the *Shari'ah* rule can be obtained for  $\theta(\Omega)$ -values, and thus for  $\{\theta(\Omega), \mathbf{x}(\theta(\Omega))\}$ . For each of these discoursed sets of values, simulative values of  $W(\cdot)$  are obtained.  $W(\cdot)$  is thus seen as a simulative criterion for evaluating the degree to which complementarities are attained over *Shuratic* processes out of a diversity of experiences in  $\{\theta(\Omega), \mathbf{x}(\theta(\Omega))\}$ .



A further extension of the *Shuratic* process formalism leads to similar limiting convergences in the knowledge domain both inter- and intra-systems. Of these, the polity-market interaction denotes *Shuratic* causal interrelations between two diverse systems, both being governed by the same methodology of the *Tachidi* worldview. The limiting convergence in  $\{\theta(\Omega), \mathbf{x}(\theta(\Omega))\}$  in any given *Shuratic* process marks the end of a set of interaction (discourse) leading to integration (limiting convergence). Now a new creative evolution to higher levels of knowledge-flows takes place. The continuity of such IIE-processes is determined by the knowledge-generating power of the continuum of the *Shuratic* processes. We thus obtain a simulated evolution form for  $W(\cdot)$  from one process into a new process of the *Tachidi* knowledge-induced discursive experience, as explained above.

↓

### Causality

$$W(\{\theta(\Omega), \mathbf{x}(\theta(\Omega))\}) \rightarrow \text{New } \theta(\Omega) \rightarrow \text{onwards repetition of} \\ \text{similar processes} \rightarrow \rightarrow \text{Hereafter} = \Omega. \quad (1.4)$$

This closure of the sequence of relations marks the completion of knowledge through the overarching world process, "*Tachidi* in the primal to *Tachidi* in the Hereafter through the process of the knowledge-induced world-systems (*Alameen*)."

### Unification as the process of functionally attaining systemic unity of knowledge

$\Omega \rightarrow \theta = (\text{Sof})(\Omega)$  is a mapping denoting the carrier of the knowledge of divine Oneness to the formation of knowledge-flows.

$\{P_1, P_2, \dots\}$  denotes the extended vector or matrix of unification between the  $\{\theta(\Omega), \mathbf{x}(\theta(\Omega))\}$  complementary pairs formed within a given *Shuratic* process and attained by means of:

- 1 interaction (discourse), integration (consensus or complementarity); and
- 2 unification by means of "pairing." Unification therefore signifies the attainment of a given level of complementarities across diversity.

In any world-system, the process of unification is evaluated by the simulation of the  $W(\{\theta(\Omega), \mathbf{x}(\theta(\Omega))\})$  criterion function according to the principle of pervasive complementarities across diversity in knowledge-induced vectors and matrix of relations signified by  $\{\theta(\Omega), \mathbf{x}(\theta(\Omega))\}$ .

Thus, unification of sequences of the *Shuratic* processes is done by means of circular causation between the knowledge-induced variables. Such a process is embedded in the continuum of interrelations,

Between  $\Omega \rightarrow$  knowledge-flows after limiting convergence in a given *Shuratic* process,  $\theta(\Omega) \rightarrow$  knowledge-induced world-system =  $W(\{\theta(\Omega), \mathbf{x}(\theta(\Omega))\}) \rightarrow$  fresh knowledge-flows repeating the previous experience at a different level of consciousness  $\rightarrow$  continuum  $\dots \rightarrow$  closure of the very large-scale knowledge-centered universe in the Hereafter ( $\Omega$ ).

### Methodology

$$\begin{aligned} [\Omega \rightarrow S \rightarrow \theta(\Omega)] \\ &= \text{epistemology and ontology} \rightarrow [\{\theta(\Omega) \\ &= (\text{Sof})(\Omega), \mathbf{x}(\theta(\Omega))\} \rightarrow W(\theta(\Omega), \mathbf{x}(\theta(\Omega))) \rightarrow \text{newer processes}] \\ &= \text{Ontic or evidential world-system} \rightarrow \text{continuum} \rightarrow \\ &\text{Hereafter} = \Omega. \end{aligned} \quad (1.5)$$

### A formal example in circular causation according to the principle of pervasive complementarities across diversity

Take  $P_1$  as market quantity exchanged;  $P_2$  as the market price of the exchanged good. Then,  $\mathbf{x}(\theta(\Omega)) = (P_1, P_2)[\theta(\Omega)]$  (meaning the vector  $(P_1, P_2)$  is induced by  $\theta$  in terms of  $\Omega$  through the ontological mapping,  $(\text{Sof})$ ). Such a mapping conveys the dynamic preference transformation caused by the induction of attributes of moderation and appropriateness of goods and stability of prices in dynamic basic-needs regimes of development. Let the evaluative joint wellbeing function of buyer (B) and seller (S) be,

$$W(P_1(B), P_2(B), P_1(S), P_2(S)) \quad (1.6)$$

where  $P_1(B), P_2(B), P_1(S), P_2(S)$  denotes the vector of prices and quantity respectively, from the buyer (B) and the seller (S) point of view.

$W$  is simulated with respect to  $\theta(\Omega)$ -values according to the following set of circular causation recursive relations:

$$P_1(B) = f_1(P_2(B), P_1(S), P_2(S))[\theta(\Omega)] \quad (1.7)$$

$$P_2(B) = f_2(P_1(B), P_1(S), P_2(S))[\theta(\Omega)] \quad (1.8)$$

$$P_1(S) = f_3(P_1(B), P_2(B), P_2(S))[\theta(\Omega)] \quad (1.9)$$

$$P_2(S) = f_4(P_1(B), P_2(B), P_1(S))[\theta(\Omega)] \quad (1.10)$$

$$\theta + = f_5(P_1(B), P_2(B), P_1(S), P_2(S), v)[\theta(\Omega)] \quad (1.11)$$

where  $\rightarrow$  denotes forward recursion on the basis of attained values of  $\theta(\Omega)$  and the other  $\theta(\Omega)$ -induced variables. This system of recursive relations denotes the nature of circular causation in the IIE-process.

### Implications of the above simulation

$$\begin{aligned} \theta(\Omega) &\rightarrow \{\theta(\Omega), P_1(B), P_2(B), P_1(S), P_2(S)\} \rightarrow W(\theta(\Omega), P(\theta(\Omega))) \\ &\rightarrow \text{recursion in the Shuratic processes.} \end{aligned} \quad (1.12)$$

*Equilibrium condition:* evolutionary equilibrium with respect to the discursion in  $\{\theta(\Omega)\}$  in relation to evolving values of  $P(\theta(\Omega))$ , institutional, policy and instrumental variables (co-operative instruments), becomes intertwined with the corresponding multimarkets and dynamic preferences as polity-market interaction proceeds. An example of the evolutionary equilibria in the IIE-process methodology is of circularly interactive knowledge-induction and feedback between consumption, production and distribution menus.

*Optimality:* there is no analytical concept of optimality as a static concept in the IIE-process methodology. Only a sequence of better states continuously evolved according to  $\theta(\Omega)$ -induction is actualized. Hence, all neoclassical axioms, including the Pareto-optimality axiom, are non-existent.

*Choices and cost implications:* no concept of opportunity cost concept exists when systemic complementarities remain pervasive. Cost (direct and indirect, private and social) is reduced by product and risk-diversification through co-operative behavior and the concomitant instruments and organization that promote these across diverse possibilities. Choice occurs in this complementary plan of action under continuous knowledge-induction of the dynamic preferences.

### Other methods related to the IIE-process methodology

#### The topic of business cycle in contrasting world-systems

A business cycle is a movement in the investment (I)-saving (S)-output (Y) relations as the economy fluctuates around the full-employment output level. Such fluctuations are caused by discrepancies in the Keynesian identity,  $I = S$ . If  $S > I$ , the economy encounters recessionary pressure. If  $I > S$ , the economy faces inflationary pressure. In such cases the economic argument presented is that market correction (competition for funds or forced investments, respectively) and macroeconomic policy (expansionary or contractionary monetary and fiscal policies, respectively) would gravitate the movement towards the full-employment output, resulting thereby in  $S = I$ .

We ask the question: Would a business cycle be absent from the Islamic economy? Not so. Verses of the *Qur'an* (12:46-49) mention about the vicissitudes of fortune that hit Egypt during the time of Prophet Yusuf. In many other verses, too, the *Qur'an* has beckoned reflection on the signs of the changing seasons, the alternation between night and day, the bestowing of power and authority to some while stripping that away from others by the divine will. The *Qur'anic* rule of *Qadr* (predestination) is considered as a paramount part of the belief in *Ta'chid*. The Prophet Muhammad never recommended undue controls in Madinah markets of the time, as it was found to be caused by sheer market scarcity and not by sellers' manipulation. Yet, the principle of justice, fairness and compassion remains foremost in the Islamic Law.

The *Qur'anic* nature of cyclical change calls for a definition and explanation of the business cycle in ways different from those in the macroeconomic literature. Unlike the movement, as explained above, in terms of savings, business cycle according to the IIE-methodology is defined by the following relationships:  $[Sp(\theta(\Omega)) - M(\theta(\Omega))]$  negative or positive;  $[Y(\theta(\Omega)) - S(\theta(\Omega))]$  negative or positive;  $[M(\theta(\Omega)) - Sp(\theta(\Omega))]$  negative or positive. Here  $M(\theta(\Omega))$  denotes the quantity of money measured as a volume of currency in circulation as determined by an ordinal value of  $\theta(\Omega)$ . That ordinal value is determined by the degree of effectiveness that  $M(\theta(\Omega))$  plays with respect to its complementary relationship with variables measuring real economic activities. In the money-real economy interrelationship the central connecting socio-economic variable is spending,  $Sp(\theta(\Omega))$ . The *Qur'an* encourages spending in moderation on the good things of life that bestow felicity to oneself and others. In this regard the *Qur'an* declares (2:261):

And render to the kindred their due rights, as (also) to those in want, and to the wayfarer; But squander not (your wealth) in the manner of a spendthrift. Verily spendthrifts are brothers of the Evil Ones; and the Evil One is to his Lord (Himself) ungrateful.

Thus, in the case of strict equality showing the fullness of circulation of resources as spending, we would have,  $Sp(k) = M(k) = Y(k)$ . The implication here is that money in Islam is not for "holding" in speculative assets and savings. Its appearance and disappearance in the form of a volume of currency occurs because of the demand for spending on the good things of life as the *Qur'an* ordains. Thereafter, the total spending on such things, valued by the currency volume, yields the value of output. The medium of saving, as withholding funds from spending, is now converted into resource mobilization.

This is the meaning of systemic unity of knowledge among the essential things in the economy, such as the volume and value of goods backing up the quantity of money circulating as currency, and vice-versa. Such a systemic unity between money and real economic activity maintains balance



(justice), fairness and, hence, price stability. All these states eventually cause a degree of social wellbeing to be attained. The meaning of the social wellbeing criterion was explained earlier as the criterion that simulates the degree of systemic unity attained in the socio-economic system.

$\theta(\Omega)$  now assumes a substantive meaning. It reflects discursive learning and can be expanded by policy variables and institutional programs as they arise in the sequences of the *Shuratic* processes. When  $\theta(\Omega)$  is expanded by policy and instrumental variables, say  $P(\theta(\Omega))$ , this would separately mean that the *Shari'ah*-driven financing and real economic instruments that enter the participatory framework between markets and institutions, are guided by the fundamental epistemology of *Tawhid* in terms of the systemic unity of knowledge. The unique presence of  $\theta(\Omega)$  in all the recursive relations and variables evolving along with increasing systemic unity, causes such variables and institutional structures to become co-determined according to the principle of pervasive complementarities across diverse possibilities.

Thus, we note that the mainstream macroeconomic and Islamic concepts of the business cycle are different from each other. First, we note that in the IIE-process explanation there can be no presence of savings, understood as the "holding" of liquid funds as an asset, and thus withdrawing it from resource mobilization in the real economy. If money is converted into resource mobilization as spending then,  $(Sp(\theta) = Y(\Omega))$ .

Furthermore, the return on savings as a liquid resource held, is a price of money as a commodity. It is called the rate of interest,  $i$ . Hence,  $S = S(Y, i)$ . Whereas spending on the good things of life causes resource mobilization, whose return is the rate of return in the real and *Shari'ah*-recommended spending, say  $r$ . Now,  $Sp(\theta(\Omega)) = Sp(Y, r)[\theta(\Omega)]$ .

In the process of the Islamic *Ummatic* formation commencing from its imperfect state to a better state, the proper specification for  $r$  would be,

$$(r/i)[\theta(\Omega)], \text{ with } i \rightarrow \text{low } i^* \text{ and } r \rightarrow \text{high } r^*, \\ \text{as } \theta(\Omega) \rightarrow \theta(\Omega)^* \quad (1.13)$$

$\theta(\Omega)^*$  is a limiting value determined over a given cycle of interaction within a *Shuratic* process. With the expansion of the *Shuratic* processes, the real-financial sectoral linkages become more effective.

The progress toward the Islamic world nation called the *Ummah* thus hinges on the progress of  $\theta(\Omega)$  which, in the usual business cycle, remains absent due to the absence of endogenous preferences, the role of ethics, policies, technologies and institutions playing a visible interactive role. Contrarily, the endogenous nature of all such variables in the IIE-process methodology causes the polity-market interactive relations to establish complementarities between the real and financial economy.

The contrasting difference between the two ideas of the business cycles is also due to the way that full-employment is variously defined in the two systems. In received economic theory, full-employment marks the long-run

neutrality of resource injection to output. Any further spending beyond this full-employment level of output leads to inflationary pressure in the conventional economic reasoning. Contrarily, in the IIE-process methodology of unity of knowledge, simulation of relations pertaining to the real and financial economy linkages cause complementarities between the underlying variables in the evolutionary dynamics of the *Shuratic* process.

Knowledge-flows are, therefore, reproduced in cycles. Subsequently,  $\theta(\Omega)$  gravitates to  $\theta(\Omega)^*$ , as shown above. In the IIE-process model, business cycles arise due to causal effect of the knowledge divergences  $[\theta(\Omega) - \theta(\Omega)^*]$  on the attainment of the relationship,  $Sp(\theta(\Omega)) = M(\theta(\Omega)) = Y(\theta(\Omega))$ . The implication, then, is this. The *Ummah* primarily promotes knowledge of the *Tawhidi* epistemology and develops its functional application to attain systemic unity of knowledge. As the knowledge-flows affect circular causation between relations of variables in the IIE-process, fresh possibilities in production, consumption and distribution menus arise. This enhances the speed of the convergence shown here.

### Conclusion: an example of a wisdom that was lost in neoclassicism – Islamic economics à la Vilfredo Pareto

In this chapter we have developed the basic precepts of the Islamic theory of knowledge premised on *Tawhid* as the Oneness of *Allah*, explained in the *Qur'an* as the completion and absoluteness of the perfect knowledge that is with *Allah* alone. A part of that, He has bestowed to the world-systems, by which they learn. The methodology of functionally deriving and making applicable the concept of systemic unity of knowledge premised on *Tawhidi* epistemology was presented. Using this methodology, a number of contrasting analytical facts were discussed between the two polar world-systems of Islam and rationalism. The example taken of the latter was the neoclassical economic theory and its frequently used concept of Pareto-optimality and equilibrium. In every case we have found that the methodology and the analytical methods so premised are quite different in the two polar world-systems.

The demise of process in neoclassical economic theory, and hence of the complex but unifying interrelationships between polity and market, was shown to have pervaded in the decadence of Islamic Economics in respect of its borrowed framework of neoclassicism. The subtle and rich challenges of the *Tawhidi* epistemology and its profound and dynamic implications in the knowledge-induced world-system were not considered by Islamic economists, except by the great thinkers of the Islamic scholasticism.

The story of this demise of Islamic Economics can, thus, be read in relation to what happened to the rich social thinking of Vilfredo Pareto, when his institutional and social engineering ideas fell into the hands of the neoclassical economic school.

The life and vision of Vilfredo Pareto (1848–1923) was a colorful one. Pareto was truly concerned with the social relevance of human actions. He wanted to tie up economics with this theme of social reality and liked to use the mathematical method to improve upon the Walrasian General Equilibrium System to incorporate the social question. He was a physicist, a mathematician, an engineer, a civil servant, then became an economic-sociologist to hold the chair of political economy in succession to Leon Walras at the University of Lausanne, Switzerland. His famous works were *Cours d'Economie Politique* on income distribution, in which he showed that an optimal and stable pattern emerges through what he upheld as the intrinsic conflict and resulting payments between classes in society. In his *Manuale d'Economia Politica* he developed the mathematical representation of consumer indifference curve and rendered it to neoclassical economic theory. In his greatest work, *Trattato di Sociologia Generale* translated as *Mind and Society*, he furthered his theory of social action, which was, later on, to grip the attention of Talcott Parsons (1964). Thus, Vilfredo Pareto was a deeply concerned economic sociologist who aimed at developing a scientific theory, whereby the social and economic interaction could be studied.

Yet, the mathematical rendering in the light of Pareto's optimal and steady-state equilibrium concepts found a home in the non-dynamic, non-process nature of neoclassical economics. Pareto-optimality as a mathematical tool used in the explanation of optimal patterns of income distribution was the result of neoclassical rendering, despite the profound intention that Pareto held in the study of social dynamics.

A similar result affected the profound message in the works of Adam Smith. In *The Theory of Moral Sentiments*, Smith (reprinted in Raphael and Macfie (eds), 1984) viewed sympathy as human value actualized by co-operative behavior. But in the *Wealth of Nations* (Smith, reprinted in Campbell and Skinner (eds), 1976) the pervasive nature of a free and unbridled self in the context of market exchange caused the individual to become self-centered. The resulting methodological individualism in freeing man from the shackles of intervention became the groundwork of the (perfectly) competitive market order. Government and social functions became artifacts to regulate the market order in the direction of the competitive economic system, so as to bestow maximum satisfaction to the individuated self. This could be a consumer, producer, institution, community and, now, the capitalist global order. The essence of human sympathy in the *Moral Sentiments* disappeared in the methodological individualism of markets, production, ownership and distribution of the *Wealth of Nations*.

The ethically benign development and, hence, the absence of interaction in economic theory, is dealt with incisively by Stehr (2002, p. 7). He writes:

A close examination of the modern literature in economics indicates, however, that the function of knowledge and information in economics activities is largely ignored by professional economists. Either that,

or economists introduce knowledge as an exogenous variable, as a commodity, or as an expense, rendering invisible the social nature of knowledge and its fabrication.

The author continues in the theme (p. 9):

Whatever culture may mean, it is equally pertinent that monocausal explanations will not work, and less so as we increasingly rely on knowledge-based economic processes.

These are important lessons for Islamic Economics. Islamic Economics is to be replaced by a world-system study of forces from a gamut of environment factors studied in the light of the *Tawhidi* epistemology of unity of knowledge, using a methodology that can explain and attain unified social representations. Within this complexity, the economic sub-process will be studied and configured as a part of the growing social totality that affects and generates systemic unity.

In the subsequent chapters we will examine many of the topics under critical investigation in this chapter, both textually and analytically. We will study them thoroughly in the light of the *Tawhidi* unity of knowledge within formal world-systems vis-à-vis the Islamic world-system.

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## 2 A formal model of the Islamic world-system

Continuing from Chapter 1, in this chapter a process model derived from the nature of the *Shuratic* process will be established. This term is derived from the *Qur'an* in terms of the interactive, integrative and evolutionary (IIE) worldview. The *Shuratic* process is a methodology associated with the meaning of an embryonic *Shura* as a discursive medium that spans across all domains of the socio-scientific order. The existence of such inherent and pervasive interaction is to be found in all realms of the natural and human order, in the seen and unseen worlds about which the *Qur'an* speaks. The latter kind of world-system may be temporally revealed or may remain permanently hidden. They also comprise the world of abstraction. Yet, in all conditions, the divine law makes all such domains profoundly interactive in the sense of knowledge-inducing human experience.

We will then formalize the nature of the process emerging from interaction and leading to integration, which is marked by consensus, equilibrium, balance and the convergence to moral purpose in all systems. Finally, from such interactive and integrative processes emerge the evolutionary processes of enhanced learning. Such an evolutionary epistemology carries the attained ontological and "ontic" (this term was coined by Sherover, 1972, and means evidential entity) scale of the knowledge-centered *Qur'anic* universe into higher stages of its moral attainment. Throughout, we note that, although the *Shuratic* process is intrinsic in the cosmic order, yet it needs human comprehension for reflection and use.

### The conceptual formalism of the knowledge model of the unity of knowledge (*Tawhid*): the IIE or *Shuratic* process

At the outset, the focus of attention is on deriving and formalizing a process model of generalized systems as shown below.

$$\Omega \rightarrow_F \{\Phi\} \rightarrow_{\Gamma^*} \{\Phi^*\} \rightarrow_{\Pi} \{\theta\} \rightarrow_{I_2} \{X(\{\theta\})\} \rightarrow_{4-\text{of } 3} \text{New } \{\theta\} \rightarrow \\ W(\theta, X(\theta)) \text{ continuity in repeated processes} \rightarrow \dots \Omega = H. \quad (2.1)$$

Primal stock of knowledge  $\rightarrow$  Derivation of primal knowledge-flows  
 $\rightarrow$  Process of deriving knowledge-flows by  $\rightarrow$  Post-evaluation  
 $\rightarrow$  Evolution of similar processes discursion  $\rightarrow$  Continuity  
 $\rightarrow$  Closure in the very large-scale universe.

In the string relation (2.1),  $\Omega$  denotes the *Tawhidi* epistemology. That is,  $\Omega$  explains the fundamental *Qur'anic* axiom of divine Oneness. It can, thus, be simply understood as the dimensionless, but creative and governing, origin of all knowledge. Hence, we intend to treat  $\Omega$  as a mathematical topology.  $\Omega$  denotes the super-cardinal domain of the completeness of divine knowledge. It thus represents the stock of the divine law in the *Qur'an*. The *Qur'an* refers to this stock of complete, absolute and perfect knowledge as the Tablet, *Lauh Mahfuz*.

$\Phi$  denotes the domain of ontology derived from  $\Omega$  in the form of the divine law (*Sunnat Allah* in the *Qur'an*).  $\Phi$  is thus the knowledge domain of the revealed *Qur'an* in the order of its completeness and absoluteness.

$F$  denotes the spontaneous and pervasive unveiling of divine Oneness in the cosmic scale through the divine law.

$\Phi^*$  denotes the domain of the further ontological comprehension of the divine law in  $\Phi$  as realized through the *Sunnah* (guidance) of the Prophet Muhammad. This medium of presenting the divine law in living experience is denoted by the mapping  $\Gamma^*$ .

$\{\theta\}$  denotes a sequence of knowledge-flows derived from the epistemology of unity of knowledge by the exercise of the *Shuratic* discourse at the level of deriving the foundation of the *Shari'ah* (*Usul as-Shari'ah*) as the core of the divine law.

The medium of the *Shuratic* discourse is denoted by the symbol,  $\Pi$ , in respect of stage 1 of the *Shuratic* process.

The primordial origin of knowledge is  $\Omega$ . The process from  $\Omega$  to  $\{\theta\}$  through the mediums as mentioned above, represents the stages of ontology, that is, the stages of unraveling of the *Qur'anic* episteme through laws, guidance and rules.

The process from  $\Omega$  to  $\{\theta\}$  in the epistemological and ontological meaning of the *Qur'anic* theory of knowledge is brought out in the *Qur'an* (4:69):

All who obey *Allah* and the Apostle are in the company of those on whom is the Grace of *Allah*, – of the Prophets (who teach), the sincere (lovers of Truth), the Witnesses (who testify), and the righteous (who do good): Ah! What a beautiful Fellowship!

The above verse establishes the confirmation and certainty of the *Tawhidi* root of the affairs of the world to the extent that they overarch from the *Sunnah* of the Prophet Muhammad to the companionship of righteous people and, thereby, to the creation of a good society on earth. The combination of these



attributes of companionship and certainty within the relational order that is presented here, implies the attributes of divine guidance and mercy that enter through the enactment of the knowledge-flows,  $\{\theta\}$ , in the order of things by which the socio-scientific domain of world-systems is defined. Such knowledge-flows at the epistemological and ontological levels are of a primordial category. They can include essential policies and their instrumentation, while avoiding details at an initial level of discourse and application. Examples of such fundamental instruments connected with the *Qur'an* and the *Sunnah* are the institutions of prayer, charity, *Zakah*, spending in a good cause and avoidance of interest in all its forms (*Riba*). Institutional details such as *Mudharabah*, *Musharakah* and similar instruments are not categories of instruments at this primal level of guidance, rules and laws.

Likewise, it is important to understand here the quintessence of *Tawhid* as the fundamental epistemology (Al-Faruqi, 1982) upon which the other two pillars of Islamic epistemology are built, namely, the *Sunnah* and the *Ijtihad* (discovering rules from the epistemological sources) of the learned ones in Islam. The latter are not solely clerics. Rather, they constitute a wide mix of all-comprehending people with the attributes of commitment, motivation and a sense of justice understood as purpose and balance. We refer to these attributes as the belief-forming virtues of the *Shu'ra* (members of the *Shura*). The *Qur'an* is clear on its stand on the point of its fundamental epistemology premised on *Tawhid* (42:52):

And thus have We, by Our Command, sent inspiration to thee (Muhammad): You knew not (before) what was Revelation, and what was Faith; but We have made the (*Qur'an*) a Light, wherewith We guide such of Our servants as We will; and verily you do guide (men) to the Straight Path ...

Furthermore, the *Qur'an* declares (24:35): "Allah is the Light of the heavens and earth."

One can find the three levels of causality in the above verses respecting the *Qur'anic* theory of knowledge relating to  $\Omega$  (including  $\Phi$ ) to  $\Phi^*$  and  $\{\theta\}$ , as given in the expression (2.1).

In the relation (2.1),  $\{X(\{\theta\})\}$  denotes the "ontic" (evidential) order of knowledge-induced cognitive and experiential evidences and entities, whose occurrence in the world-system is due to an extensively complex but orderly system of complementary interrelationships emanating from the comprehension and application of the laws, guidance and rules formed through instrumentation at the ontological stage on the basis of the epistemological premise. This medium toward realizing knowledge-induced ontic forms is denoted by  $f_2$ .

In the relation (2.1),  $W(\theta, X(\theta))$  denotes the wellbeing function expressed in terms of the pervasively complementary variables, relations, policies and rules included in  $\{\theta, X(\theta)\}$ . The process from  $\Omega$  to the end of the

post-evaluation by means of  $W(\theta, X(\theta))$  in the first process, marks the completion of one level of knowledge formation from the epistemological to the ontic level through the ontological medium.

In this regard the *Qur'an* declares (13:2): "He does regulate all affairs, explaining the Signs in detail, that you may believe with certainty in the meeting with your Lord." Furthermore, there is the verse (4:59):

Not a leaf does fall but with His knowledge: There is not a grain in the darkness (or depths) of the earth, nor anything fresh or dry (green or withered); but is (inscribed) in a Record clear (to those who can read).

On the matter of the unseen events that are brought into the same process order, we have the verse (11:123):

To Allah do belong the unseen (secrets) of the heavens and the earth, and to Him goes back every affair (for decision); Then worship Him, and put your trust in Him: and your Lord is not unmindful of aught that you do.

The evaluation of  $W(\theta, X(\theta))$  on the basis of the confirmation, affirmation or revision of the earlier sets of ontic relations, including the rules so formed, gives rise to  $New\{\theta\}$ . Sen (1990) has used a similar concept of social wellbeing in the ontological sense of ethics and the economy. The medium of realizing this new round of process is attained by once again referring to the epistemology and to the ontological and ontic rules so formed for deriving experiential rules and guidance from the divine roots. This medium is denoted by  $f_3$ . In regard to this systemic re-origination of the creative order, the *Qur'an* declares (27:64): "Or, who originates Creation, then repeats it, and who gives you sustenance from heaven and earth? (Can there be another) Allah besides Allah? Say, 'Bring forth your argument, if you are telling the truth!'" Also, refer to the verse (29:19): "See they not how Allah originates creation, then repeats it; truly that is easy for Allah."

The affirmation of the continuity of the circular causation process into creative evolution can be derived by the exegesis of the verse (10:4): "It is He who begins the process of creation and then repeats it, that He may reward with justice those who believe and work righteousness ..."

In these and other verses of the kind, the re-origination process is shown to be a universal one across space and time, for the domain of Allah is pervasive. Across these domains rules the power of Allah's knowledge enlightening the world-systems, for "He is the First and the Last."

In this way, a second round of the *Shuratic* process emerges and completes itself. It is followed by many more of the same kind. The continuous sequences of onward moving knowledge-centered processes relating epistemology to ontology, and, thereby, to ontic forms, thus emerge and repeat themselves with the advancement, confirmation and revision as required in



the emerging experiences of realizing unity as complementary relations between organic diversity. The end of these continuous processes of knowledge-flows is the return to *Allah* in the Hereafter, *Akhira*, as the Great Event (*Naba ul-Azim*). In this respect the *Qur'an* declares (78:1-2): "Concerning what are they disputing? Concerning the Great News." Furthermore, the Great News is equivalently explained to mean the Hereafter in the verse (78:39): "That Day will be the sure Reality: Therefore, who so will, let him take a (straight) Return to his Lord!"

The fact that this cosmic and worldly experience through seen and unseen things of total creation is a cumulative experience towards the completion of knowledge in the Hereafter as it is in the primal *Tawhid*, is brought out in various parts of the *Qur'an*. Here are a couple of the verses:

He is the First and the Last, the Evident and the Immanent: and He has full knowledge of all things.

(57:3)

... But We leave those who expect not their meeting with Us, in their trespasses, wandering in distraction.

(10:11)

The blissful event of the Hereafter as the completion of knowledge is narrated in a *Hadith* of the Prophet Muhammad, wherein *an-Najwa* is explained as the confidential talk between *Allah* and His devotee on the Day of Judgment (*Sahih Al-Bukhari*, Vol. 6, *Hadith* No. 105). In this confidential converse *Allah* forgives the most hidden sin of the believer and lets him totally free and pure:

During the lifetime of the Prophet some people asked, "O *Allah's* Messenger! Shall we see our Lord on the Day of Resurrection?" The Prophet said, "Yes; do you have any difficulty in seeing the sun at midday when it is bright and there is no cloud in the sky?" They replied, "No." He asked, "Do you have any difficulty in seeing the moon on a full moon night when it is bright and there is no cloud in the sky?" They replied, "No." The Prophet said, "(Similarly) you will have no difficulty in seeing *Allah* on the day of Resurrection as you have no difficulty in seeing either of them."

On the cognitive perfection that will be attained by believers we have the verses:

(This will be) their cry therein: "Glory to Thee, O *Allah*!" And "Peace" will be their greeting therein! And the close of their cry will be: "Praise be to *Allah*, the Cherisher and Sustainer of the Worlds!"

(10:10)

And We shall remove from their hearts any lurking sense of injury – beneath them will be rivers flowing; and they shall say: "Praise be to *Allah*, Who has guided us to His (felicity): Never could we have found guidance, had it not been for the guidance of *Allah*: Indeed it was the truth that the Apostles of our Lord brought unto us." And they shall hear the cry: "Behold! The Garden before you! You have been made its inheritors, for your deeds (of righteousness)."

(7:43)

The culmination of the continuous processes of knowledge-flows in the Hereafter is expressed in the *Qur'an* both in terms of its transcendental meaning and its cognitive and sensate meaning. In terms of its transcendental meaning there is the narrative of the event of meeting *Allah* in Heaven which, indeed, is the event of the highest felicity for the believer and can thus be characterized as the event of the fullness of knowledge in the believer bestowed upon him according to his rank. The *Qur'an* speaks of this union with *Allah* in the Hereafter as the event of *an-Najwa*, as mentioned above.

The above verses highlight the integral role of and, hence, complementary relation between, knowledge-induced entities expressed in the criterion of supreme felicity. The events of "Removing from their hearts every lurking sense of injury" is the liberation of the soul to the height of supreme freedom. This is what full and complete knowledge endows on the believer. The salutation, "Praise be to *Allah*, . . .," is the highest cognitive attainment in terms of meeting with *Allah* with perfect spiritual rendering.

The promise "Behold! The Garden before you!" conveys the realization of the sensate essence of supreme felicity. These are all combined, as in the "paired" nature of *Qur'anic* universes, in corporeal life as in the Hereafter, in bestowing on the believer the divine guidance sent through the apostles, the sole source of the knowledge of the divine unity. Among these messages, the *Qur'an* encompasses the message of Islam sent to the Prophet Muhammad as the supreme one (48:28): "It is He Who has sent His Apostle (the Prophet Muhammad) with Guidance and the religion of Truth, to proclaim it over all religion: and enough is *Allah* for a Witness."

### Relational correspondences of *Tawhid* in the Hereafter (*Akhira*) in terms of the principle of universal complementarities

Sensate fulfillment will be the supreme felicity (*Fauz al-Azim*) of the Garden of Bliss (*Jannah*), which is also the optimal realization of knowledge attained through the medium of correspondence between all things that have attained such a perfect knowledge in and of themselves. Indeed, we note that, here too, the principle of the "paired" universe, which we treat as

the basis of the principle of complementarities within diversity in the ontic phenomena of the knowledge-induced things of life, is shown to abide in the Garden of Bliss as well.

The principle of universal complementarities arising from the *Qur'anic* principle of creation in "pairs," is repeated in the *Qur'an*. For an exegesis we turn to the following verses:

... and fruits of every kind He made in "pairs," two and two: He draws the Night as a veil over the Day. Behold, verily in these things there are Signs for those who consider!

(13:3)

Glory be to *Allah*, Who created in "pairs" all things that the earth produces, as well as their own (human) kind and (other) things of which they have no knowledge.

(36:36)

In the *Qur'an* we find the allegory of "pairs" in creation being reflected upon in the form of physical happenings between Night and Day, the Sun and the Moon, Life and Death, etc. The meaning here is of the purposeful essence of the interaction between, and the co-existence of, such complementary events, the result of which is the bestowing of balance in the natural order and human wellbeing in the social order.

The most picturesque understanding of this "paired" nature of reality is to be found in the whole of Chapter 55 (*Rahman, Allah* Most Gracious). Note, for instance, the verse (55:46-47): "But for such as fear the time when they will stand before (the Judgment Seat of) their Lord, there will be two Gardens - then which of the favors of your Lord will you deny?"

Furthermore, the multiplicity of such "paired" blessings in Heaven is pointed out in the *Qur'an* (55:62-63): "And besides these two, there are two other Gardens, - then which of the favors of your Lord will you deny?"

The permanent confirmation of the eternal principle of universal complementarities between diverse blessings in life and in Heaven, is established by the *Qur'an* (55:60): "Is there any Reward for Good - other than Good?"

### Transmission functions in the circular causation model of unified reality

Finally, one notes the centrally important role played by the transmission functions, F and F\* in the *Shuratic* process or the circular causation and continuity worldview of unified reality in the IIE-process, as delineated in Chapter 1. As explained earlier, these are the groundwork of the *Shari'ah* and its application arising from the *Qur'an* and the *Sunnah*. In the *Qur'an*, these transmission mappings can be derived from the exegesis of the following verse (42:51):

It is not fitting for a man that *Allah* should speak to him except by inspiration, or from behind a veil, or by the sending of a Messenger to reveal, with *Allah's* permission, what *Allah* wills: For He is Most High, Most Wise.

In this verse, we have all the transmission mappings, namely, F = revelation; F\* = deriving the *Usul* of *Shari'ah*; f1, f2, f3 = deriving knowledge-flows and the origination of knowledge-induced entities in the *Shuratic* process.

The same message is emphasized in the following verse. It confirms the absolute primacy of the *Tawhidi* episteme and its completeness in the ontological order of the laws over all other components of Islamic epistemology, together with the principal causation between these other components (42:52):

And thus have We, by Our command, sent inspiration to you (Muhammad) You knew not (before) what was Revelation, and what was Faith; but We have made the (*Qur'an*) a Light, wherewith We Guide such of Our servants as We will; and verily you do guide (men) to the Straight Way.

The extension of the *Usul* (foundation) of the *Shari'ah* is then proven to hold its domain over all world-systems according to the *Shuratic* process. In this regard the *Qur'an* declares (42:52-53): "... and verily you (Muhammad) guide (men) to the Straight Way, - The Way of *Allah*, to Whom belongs whatever is in the heavens and whatever is on earth."

Finally, the cumulative evolutionary "straight path" of divine knowledge is shown to self-reference itself in the *Tawhidi* episteme at every moment of the circular causation process and, thus, to culminate into the final return to *Allah* in the Hereafter. The *Qur'an* declares (42:53): "Behold (how) all affairs tend towards *Allah*!"

### The appropriateness of the term *Shuratic* process, as derived from the exegesis of the *Qur'an*

Verses 49-53 of Chapter 42, *Shura* (Consultation) establish a prime *Qur'anic* premise giving the total meaning of the *Shuratic* process as a circular causation and continuity relational worldview of unified reality. There are other verses of the *Qur'an* that equally present this methodology of the *Shuratic* process in its comprehensive meaning of intrinsic interaction, integration and creative evolution of the pervasively knowledge-centered worldview. We have used the terminology *Shuratic* process because the deepest meaning of the relational worldview in this regard comes out of the concluding section of the *Qur'anic* chapter called *Shura*, meaning consultation. But the meaning of consultation can be for human discourse or interaction and integration



among all kinds of entities in diverse world-systems and the discovery and study of systemic interaction, integration and creative evolution.

Elsewhere, the *Qur'an* beckons to the reader about communities among birds, about as many dimensions under the earth as above it and the conscious communion of such worlds with *Allah's* law prevailing. We learn about the Prophet Sulaiman conversing with communities (*Ummamun*) of the bird and insect worlds. This was an expression of consciousness and submission of such communities to *Allah*.

Hence, the meaning of knowledge-induced conscious learning is spread out in all forms of the world-systems. The principle of embryonic learning through participation, interaction and unity of knowledge for dynamically unraveling the hidden mysteries of things is termed the *Shuratic* process. Such processes are to be found in all kinds of world-systems (*'Alameen*).

### The methodology of the *Shuratic* process as an interactive, integrative and evolutionary (IIE-) process

We have mentioned earlier that the methodology of the *Shuratic* process is equivalent to the interactive, integrative and evolutionary process in the mathematical language of the stock and flow of knowledge. In this world-view of the unifying relations we face deep reference to epistemology and ontology as in the philosophy of science. We will now investigate this methodological formalism. We begin with some essential definitions.

### The stock of complete knowledge (treated as primal topology), $\Omega$

We will treat  $\Omega$  as a universal topology in the sense that it is defined by the completeness of divine knowledge, referred to here as the stock of knowledge. In the mathematical topological sense, the idea of stock is to be understood as a topological domain of the primal origin. From it emanates an endogenous flow of non-diminishing knowledge as law and guidance. The stock in such a non-material domain cannot be of a diminishing category, for laws and guidance are not diminished and exhausted by use. Likewise, such laws and guidance being unchangeable, they do not get augmented at this primal level, since *Tawhid* exists exogenously of all ontological and ontic phenomena. Such an exogenous nature of the stock of knowledge, *Tawhid*, establishes its self-referencing nature. *Tawhid*, thereby, induces the ontic reality at every juncture of a process re-originated from the previous one through the medium of knowledge-flows. Hence, in the very large-scale universe of the relation, " $\Omega$  in the primal to  $\Omega$  in the Hereafter," the permanence of the impact of  $\Omega$  on the forward knowledge-centered movement of the ontic processes, remains fundamental.

It is, therefore, the cumulative power of knowledge-flows caused by  $\Omega$  on the ontic world that regenerates itself in the Hereafter as the great event (*Naba ul-Azim*). When understood in this sense of the unraveling of divine power (knowledge), first in the form of knowledge-flows in a small-scale universe and then by its full impact on the events of a very large-scale universe, we can reflect on the meaning of completeness and absoluteness. Completeness of the stock cannot be the accumulation of knowledge-flows in ontic things alone, towards recreating the stock in the Hereafter. Rather, completion here means the unraveling of the full power of  $\Omega$  on the very large-scale universe that repeats the primal stock as the terminal stock. This is the idea explained by the process, " $\Omega$  in the primal to world-systems onto  $\Omega$  in *Akhira*." This correspondence is most importantly a causal relation of " $\Omega$  onto  $\Omega$  through the passage of the knowledge-induced world-systems," that is, between *Tawhid* in the primal to *Tawhid* in the Hereafter through the medium of a continuously learning and unifying universe.

The above concept of the topology of a stock of knowledge in terms of its identity between primal and terminal forms is derived from the *Qur'an* (42:49): "To *Allah* belongs the dominion of the heavens and the earth. He creates what He wills (and plans) ..."

The exegesis of this verse is centered on noting the equivalence of "dominion" with the concept of the *Tawhidi* topology (Choudhury, 1995). That is, the topology of the complete and absolute knowledge is inferred from the portion, "He creates what He wills," and the nature of *Tawhidi* topology being premised on the divine law is inferred from the fact that "He creates what He wills" according to His plans (*Sunnat Allah*). The transition from "primordial  $\Omega$  to  $\Omega$  in *Akhira*" through continuous self-referencing to  $\Omega$  along the IIE-process is inferred from the verse (42:53): "Behold (how) all affairs tend towards *Allah*!" Also note the verse (92:13): "And verily unto Us (belong) the End and the Beginning."

From the following *Hadith* of the Prophet Muhammad we understand the role that divine mercy, as the offshoot of divine knowledge, plays on the world and what its relationship is with the stock of terminal mercy. The point here is that it is the divinely "loaned" mercy to the world-systems that accumulates to fullness in the Hereafter. It then combines with the fullness of the stock of divine knowledge. A loaned substance does not cause diminution of the stock, for the "loaned" part is of and from the stock:

Verily *Allah* created Mercy. The day He created it, He made it into one hundred parts. He withheld with Him ninety-nine parts, and sent its one part to all His creatures. Had a disbeliever known of all the Mercy which is in the Hands of *Allah*, he would not lose hope of entering Paradise, and had a believer known of all the punishment which is present with *Allah*, he would not consider himself safe from the Hell-Fire.

(*Sahih Al-Bukhari*, Vol. 8, *Hadith* No. 476)



### The super-cardinality question of the divine stock of knowledge

Although  $\Omega$  is exogenous because of its primal nature, it is, nonetheless, centrally functional in all of reality. But to make this correspondence between absolute and complete knowledge and flows of knowledge meaningful, we need to define the topology of the stock in terms of its cardinality (Maddox, 1970). It must, however, be understood that we are simply conceptualizing here the cardinality of a non-dimensional entity, that of the topology of knowledge. This does not implicate a cardinal value to the divine being. Rather, the result of cardinality here is to well define the relational nature of mappings given in expression (2.1). Certain *Qur'anic* verses and a *Hadith* testify to the correctness of such an approach. First, in respect of the need for defining a meaningful correspondence between  $\Omega$  and the ontic world-systems, we take the broad implication from the verse (42:49): "... He bestows (Children) male or female according to His Will (and Plan), or he bestows both males and females, and He leaves barren whom He will: For He is full of knowledge and power."

Such a relationship can occur only through the divine will (law) in the absence of any corporeal manifestation, implied or otherwise, of *Allah* in the ontic events. Without this understanding, any such correspondence would be pantheistic and would stand rejected by the *Qur'an*. In regard to the impossibility of manifesting *Allah* in any shape and form (7:143) the *Qur'an* declares:

... He (Moses) said "O my Lord! Show (Yourself) to me, that I may look upon You." *Allah* said, "By no means can you see Me (direct); but look upon the mount; if it abides in its place, then shall you see Me." When his Lord manifested His glory on the Mount, He made it as dust, and Moses fell down in a swoon.

Thus, Moses was not able to see *Allah* directly.

A saying of Ayesha, the pious wife of the prophet, states:

If anyone tells you that Muhammad has seen his Lord, he is a liar, for *Allah* declares, "No vision can grasp Him." (*Qur'an*, 6:103). And if anyone tells you that Muhammad knows the Unseen, he is a liar, for *Allah* declares, "None has the knowledge of the Unseen but *Allah*."

(*Sahih Al-Bukhari*, Vol. 9, *Hadith* No. 477)

One *Hadith* declares (Ghazzali, trans. Buchman, 1998), "God has seventy veils of light and darkness; were He to lift them, the august glories of His face would burn up everyone whose eyesight perceived Him."

In the absence of the non-corporeal presence of *Allah* in the world, it must simply be the medium of the divine law and guidance alone that makes *Allah's* divine presence possible in all relations of the world-systems. The same medium of transcendental relationship explains the manifestation of the complete stock of divine knowledge in the Hereafter. On this matter, verse (40:15) maintains:

Raised high above ranks (of degrees), (He is) the Lord of the Throne (of authority = *Arsh*); By His Command does He send the spirit (of inspiration) to any of His servants He pleases, that it may warn (men) of the Day of Mutual Meeting, ...

Al-Hilali and Khan (1990: Vol. III, p. 118) write about this aspect of the relationship between *Allah* and the universe as shown in the *Qur'an*: "*Allah* Himself (*Dhat*) is not present with us but He is present with us by His Knowledge."

We define the concept of cardinality in *Tachidi* topology to mean a concept of generating explainable mappings for the emergence of the *Qur'anic* world-systems. We will refer to such a universal cardinality of the stock of divine knowledge as super-cardinality, SC( $\Omega$ ) of  $\Omega$  (Choudhury, 2000). Super-cardinality is, thus, the topological function of an unbounded universe of *Tachid* and equivalently, of *Akhira*, that cannot be configured but is relationally meaningful in terms of the *Allah*-world-system-*Akhira* circular interrelationship. It is not necessary either to measure such a topology or to identify any of its elements. Only the stock of knowledge embodies the primal topology and from this emanates the causation of all ontic domains while establishing the nature of knowledge-flows in the midst of universal complementarities across diversity. This alone is the sure sign of the unity of knowledge among interacting entities across agents, variables, their relations and the world-systems.

Thus,  $\Omega$  contains the accumulation in the super-cardinal sense of all truth statements and also their opposites comprising false statements. That is, true  $\neq$  false; truth  $\neq$  falsehood. By this "mathematical complementation (opposite)" property,  $\Omega$  contains the null set and the universal set. The null set is defined by  $\{\Phi = \{\Phi\} \cap \{\Phi'\}$  with regards to expression (2.1). Here,  $\{\Phi\}$  denotes the complete class of all true statements.  $\{\Phi'\}$  denotes the complete class of all false statements. In terms of the universality of the divine law, both events are explained in their primal form. These comprise the truth of the Oneness of *Allah* as the episteme, and the principle of universal complementarities in the ontic sense of the unification of knowledge.  $\{\Phi\}$  and  $\{\Phi'\}$  together, then, characterize the complete divine law, explaining the totality of truth statements and false statements, respectively. We also call these disjointed categories the primal stock of knowledge and the primal domain of "de-knowledge," respectively.

## The nature of the IIE-process at the level of the knowledge-flows

### The analytical nature of the Qur'anic epistemology

We define a knowledge-flow by a derivation of laws, rules and guidance from the tenets of the divine law at the epistemological level. Thus, knowledge flows commence at the ontological levels of  $F$  and  $f^*$  in expression (2.1). This statement needs explanation.

At the level of  $F$ , one notes that within the created worldly knowledge, full knowledge was bestowed on the Prophet Muhammad when he was taken across the realm of worldly knowledge into the mysteries of truth. In this regard the *Qur'an* declares (53:14-18):

Near the Lote-tree beyond which none may pass; near it is the garden of Abode. Behold, the Lote-tree was shrouded (in mystery unspeakable!). (His) sight never swerved, nor did it go wrong! For truly did he see, of the Signs of his Lord, the Greatest!

Yet no mortal has been given the complete knowledge that is *Allah's* alone. This was explained earlier by reference to the appropriate *Qur'anic* verses and *Hadith*. Consequently,  $F$  does not make explicit the divine law in its *primordial* form. Rather, it derives laws for socio-scientific ontology by way of guidance and also subsidiary laws that carry the divine essence in the world-systems.

There is no doubt among *Qur'anic* scholars that the *Hadith* literature exists in two forms (Azami, 1978). These are divided into a category of inspirational type, which are believed to have been inspired to the Prophet Muhammad by *Allah* through the angel Gabriel. Such *Hadith* are termed as *Hadith al-Quds*. These are the sacred *Hadith*. Such *Hadith* draw their source from *Allah* Almighty directly through the angel Gabriel (Ibrahim and Johnson-Davies, undated, pp. 7-23). On the other hand, the *Hadith* ascribed to the Prophet himself through the chain of narration (*sanad*) are referred in the first person to the Prophet. In using the second form of *Hadith* the Prophet's knowledge of the divine mysteries covered the fullness of all *humanly* possible known domains. The privilege of acquiring all the stock of humanly possible knowledge of the divine was conferred on the Prophet Muhammad alone. Yet, this was not *complete* knowledge in the sense of the *Tawhidi* stock.

Despite this qualification, all *Hadith* remain as strings of ontological knowledge-flows from which posterity is to derive a broader, deeper and greater meaning of life, yet first, in conjunction with the *Qur'an*. Several *Hadith* support this viewpoint. Of these is the following: Ibn Masud, a companion of the prophet, said: "The Prophet was asked about the spirit, and he kept quiet till the divine inspiration was revealed, '... (judge

between men) by what *Allah* shows you'" (4:105) (Al-Hilali and Khan, 1990, Part 3, p. 97). A further *Qur'anic* verse in this regard is (10:109): "And (O Muhammad), follow you the inspiration sent unto you, and be patient till *Allah* gives judgment. And He is the Best of Judges."

Although the *Qur'an* is indisputably a work of detail and clarity, it is left to human wisdom, inspired by divine knowledge, to search for and discover the extensive meaning and application of such *Qur'anic* rules. Likewise, therefore, *Hadith* corresponding to revelations as they came to the Prophet Muhammad must also be qualified by such a possibility for the extension of meaning. Consequently, although the authentic *Hadith*, together with *Hadith al-Quds*, remain precise conveyors of the divine law, they must also be understood in the interpretive sense according to their ontological implication to life's diverse problems. The mapping in expression (2.1),  $F$ , thus remains ontological in essence. The above argument surrounding the recording and authenticity versus dispute over *Hadith* can be found in Azami's work (1978).

### The ontology of the discoursed knowledge derivation from the epistemological roots

The same may be said, but to a lesser extent, in regard to the derived function,  $f^*$  in expression (2.1). However, given the *Qur'anic* revelation and the acceptance of *Hadith al-Quds* together with the authentic *Hadith*, as explained above, the function of  $f^*$  is precisely to provide details of interpretation and the application of the primary body of knowledge to details of life. Thereby, diversity in the understanding and application of the fundamental body of *Qur'anic* and *Sunnatic* knowledge for the socio-scientific order increases exponentially across space and time. This is where a clear delineation is necessary between the core or the *Usul as-Shari'ah* as the divine law and the relativistic development of *Urf* and *Adah* (regional variations in customs and practices) into the *Shari'ah* due to the space and time variations of human problems (Masud, 1984).

Hence,  $f^*$  in expression (2.1) is of a truly ontological nature in deriving the rules and guidance for addressing diverse problems of the socio-scientific order. Therefore, the actions that arise from the medium of  $f^*$  are intensely discursive according to the diversity of interpretation and application provided under the discourses within the *Shuras* of the socio-scientific groups. This, however, does not mean losing sight of the divine moorings of the unity of knowledge and the law and guidance leading to the comprehension and application of divine Oneness. The implication is stronger. That is, the process of extracting rules by discourse and consensus from the epistemological source, called *Ijtihad*, leads to consensus, i.e. *Ijma*. The emanating inferences and rules are perfectly changeable at the ontological level within the substantive requirement for maintaining and sustaining the



essence of the unity of knowledge. The *Tawhidi* epistemology must permanently govern all such creatively dynamic searches (*Jihād*) and changes by spiritual reflection (*Tafakkur*). Only then can they lead to consensus or integration (*Ijma*) along the path of search, discovery (*Ahkam* and *Ayath*) and application (*Burhan* = proof, argument) at the ontological and ontic stages of knowledge formation.

We have now derived the sequence,  $\{\Omega \rightarrow \Phi \rightarrow \Phi^*\}$ , via the mappings F and f\* in expression (2.1) in respective stages. Herein we find that while the sequence,  $\Omega \rightarrow \Phi$ , is a unique one in the light of the permanence and immutability of the *Qur'an*, *Hadith al-Qudsi* and the authentic *Hadith*, yet the process,  $\{\Phi \rightarrow \Phi^*\}$ , is a multidimensional one within the *Shuratic* process. There exists interaction leading to integration and these two lead to the creative evolution of knowledge-flows in forming laws, rules, guidance and instruments at the ontological and ontic levels. Because of the multidimensional nature of f\* in deriving knowledge from the sequence,  $\{T \rightarrow \Phi\}$ , this functional form ceases to be linear. Instead, it is diverse and complex within the multidimensional perspective of unity within diversity that characterizes the unity of divine knowledge.

This is the strong implication of the interactive, integrative and evolutionary (IIE) methodology or the *Shuratic* process pertaining to the formation of the fundamental knowledge of the divine law and guidance at the very first level of the *Shuratic* process.

This strong implication has vast institutional and social contractarian meaning for the world nation of Islam (*Ummah*). It leads to a collective and unified method of studying, understanding and applying the *Tawhidi* worldview to all facets of experience in the *Ummah*. The *Shuratic* process in such a framework gives the *Ummah* its distinctive identity as a unified organic global entity. In it the hegemony of groups and clergy is subdued and replaced by the participation of a *Qur'anic*ly conscious populace represented by learned and Allah-conscious members, the *Shuraes*. The result of such a conscious representation is the central role of the motivation, commitment and understanding of the principle of justice as balance among the *Shuraes*. There are various verses in the *Qur'an* to testify to the above facts at the level of knowledge formation in the IIE-process methodology (Choudhury, 1994).

In regard to the matter of harmony as unity within diversity in explaining the divine law, we note the verse (17:89): "And We have explained to man, in this *Qur'an*, every kind of similitude; yet the greater part of men refuse (to receive it) except with ingratitude."

On the matter of the distinct nature of the *Qur'anic* worldview from all other ones, we have the verse (2:145–147):

Even if you were to bring to the people of the Book all the Signs (together), they would not follow your *Qibla*; nor are you going to follow their *Qibla*; nor indeed will they follow each other's *Qibla*.

If you after the knowledge has reached you were to follow their (vain) desires, – then were you indeed (clearly) in the wrong. The people of the Book know this as they know their own sons; but some of them conceal the truth which they themselves know. The Truth is from your Lord; so be not at all in doubt.

Here, the meaning of *Qibla* is far wider than simply the direction of prayer. It stands for the contrasting worldviews between *Tawhid* and other beliefs.

Furthermore, on the question of the self-evidence of the *Qur'an* on truth without coercion, there is the verse (2:256):

Let there be no compulsion in religion: Truth stands out clear from Error: Whoever rejects Evil and believes in Allah has grasped the most trustworthy hand-hold, that never breaks, and Allah hears and knows all things.

### From the stage of ontology to the stage of the ontic determination of knowledge-flows

Our next step in establishing the IIE-features of the *Shuratic* process in expression (2.1) is to examine the ontic stage of knowledge-flows in the light of the *Qur'an* and the *Sunnah*. We now consider the relation,  $\Omega$ , that derives primary knowledge-flows from  $\Phi^*$  and maps them "onto" the realm of knowledge-flows,  $\{\theta\}$ , that determine the entities of world-systems, the ontic forms. Since  $\Phi^*$  is subject to the IIE-process methodology within an extensively participatory *Shura* in socio-scientific world-systems, as explained earlier with regards to such an embryonic microcosm, therefore, the domain of  $\{\theta\}$  must also be of the same nature. At this level, human participation in the social, economic and other human experiences are combined with the intrinsic nature of systemic interaction, dynamic equilibrium and knowledge-shared understanding in the ontological domain,  $\{\Omega \rightarrow \Phi\}$ , in generating the process of discourse. The IIE-process methodology is thus carried forward extensively and intrinsically to the level of knowledge-flows pertaining to the comprehension and reflection of the emanating laws, guidance and rules that are derived.

An example here is of a theory of justice and freedom that must govern social preference formation in an Islamic social contract. Imam Shatibi looked into this significant question in his theory of *Al-Maslaha wal-Istihsan* (preference formation for the public purpose) (Shatibi, trans. Draz, undated). *Al-Maslaha* revealed the single most important function of the Islamic state as that of transforming and realizing social preference in accord with the tenets of the *Shari'ah* pertaining to choices in economy, society and in the extensive ethical domain of polity-market-social interaction that we call human ecology.



Human ecology encompasses the extensive domain of interaction between human communities and ethics, environment and the global order (Hawley, 1986). Since such interactive preferences are the result of the formation of knowledge out of participation between institutions, markets, individuals, households, businesses, communities and the environment, an underlying IIE-process methodology governs this kind of knowledge formation. The very creatively dynamic feature of the IIE-process, as explained earlier, makes the resulting preference formation dynamic in nature. Such preferences form the extensive basis of Islamic social choice and, thus, of the participatory worldview of the *Shura* institutions and socio-scientific praxis. This is the initiating premise of Islamic social contract theory in the *Maslahah* of Imam Shatibi (Masud, 1984; Choudhury, 1993). To Imam Shatibi, epistemological investigation (*Ijtihad*) and social consensus on debated or established issues (*Ijma*) were premised on the exogenous prevalence of the unique mapping  $\{\Omega\}$  to  $\{\Phi\}$ , but they evolve dynamically through  $\Phi^*$  towards acquiring deeper knowledge of  $\{\Omega\}$  to  $\{\Phi\}$ . The process  $\{\Omega\}$  to  $\{\Phi\}$  cannot, therefore, be a static process. The *Shari'ah*, thus, becomes a dynamic process of understanding and unraveling of reality. The evolution of the *Shari'ah* in this sense and the formation of social preference within the Islamic social contractarian model marks the phase of deriving  $\{\theta\}$ -values using the IIE-process methodology.

The *Qur'an* is quite clear on the above kind of freedom given to knowledge formation in stages. We have earlier explained the verses from Chapter 42 of the *Qur'an* entitled *Shura* or Consultation (particularly note verses 49–53). We further support the exegesis of the above-mentioned verses by the following (25:33):

Those who reject faith say: "Why is not the *Qur'an* revealed to him all at once?" Thus (is it revealed), that We may strengthen your heart thereby, and We have rehearsed it to you in slow, well-arranged stages, gradually. And no question do they bring to you but We reveal to you the truth and the best explanation (thereof).

The exegesis of this verse is that the *Qur'an* spreads out its fathomless knowledge in degrees according to the magnitude and nature of a problem both at the cognitive and practical levels. The effective resolution of such a problem as it occurs and as it is addressed by *Qur'anic* knowledge instills progressive confirmation in the believers. The extension of this proof (*burhan aqli*) proves the universality of the *Qur'anic* worldview.

### From the stage of knowledge-flows to the stage of evidence

The next step in formalizing the IIE-process methodology within the general systems framework of the *Qur'an* is to extend the knowledge-flows

in their primal stage to the ontic world-systems of observed and relational entities. Here, we are carrying the knowledge-formation stage from the complex process of IIE in establishing the comprehension and reflective cognitive power in the human world to its application in experiential world-systems, where divine evidence is generated by the impact of the knowledge-flows. We now define knowledge-induced evidences (*Ayaths*) in *Qur'anic* world-systems by the complexity of such interactive forms. The knowledge-induced evidences (*Ayath Allah*) are denoted by  $\{X(\theta)\}$ . In this way, the complete first stage of objectification of the IIE-world-systems comprises the entire chain,  $\{\Omega\}$  to  $\{\Phi\}$  to  $\{\Phi^*\}$  to  $\{\theta\}$  and onto  $\{X(\theta)\}$ , through the relations  $F, F^*, f_1, f_2$ , as shown in the expression (2.1). We now note that as the ontological and ontic formation of knowledge is governed by the primal epistemology of *Tawhid*, so also the *Qur'anic* world-systems are spanned by knowledge-flows. These functional relations carry forward the same complexity of interaction, integration and creative change from the level of primal knowledge formation into the ontic domain of evidence. Such an IIE-process makes relations extensively unified across diverse domains of experience.

We will denote the spaces of knowledge-induced entities by  $\{X(\{\theta\})\}$ . Like knowledge-flows, the  $\{X(\{\theta\})\}$ -values, which are simply monotonic functions of knowledge-flows in real-world evidence also form their own topologies. In this way, for the entire class of such functional forms we obtain  $\{X(\{\theta\})\}$  as a monotonic transformation of  $\{\theta\}$  in real-world relations via a sequence of mappings of the type shown by  $\{f\}$  in expression (2.1).

### The role of divine attributes in knowledge formation

We now go back to the epistemological premise to note that  $\{\Phi\}$  and  $\{\Phi^*\}$  are both realized through the pre-existence of divine attributes that are guided by the principles of justice, motivation and commitment as directed by divine decree. These attributes also qualify the subsequent chain of relations in expression (2.1) at two levels. Up to the stage of  $\{\theta\}$  commencing from the premise of  $\{\Phi^*\}$ , it is the medium of comprehension and reflection on the divine law that formulates laws, rules and guidance. At the level of  $\{X(\{\theta\})\}$  it is the application of the laws, rules and guidance followed by more knowledge-flows of the same kind arising from the circular causation and learning processes that are of importance. Hence, we say that the "pairs,"  $\{\{\theta\}, \{X(\{\theta\})\}\}$ , remain as combinations of ontological (i.e. formation of  $\{\theta\}$ ) and knowledge-induced ontic entities (i.e. formation of  $\{X(\{\theta\})\}$ ). The latter are equivalent to the *Qur'anic* evidence of living experiences (*Ayaths*). We note here that the combination of the ontological with the ontic sensations generates a continuation of knowledge-induction by means of the epistemological roots of  $\{\Phi\}$  and the ontological

roots of  $\{\Phi^*\}$ . In every such case there is induction by the vector of attributes denoted by  $[A]$ .

With regard to the primal role of the attributes of justice, commitment and motivation within the divine decree, the *Qur'an* speaks of the mission of the Prophet Muhammad (27:91–92):

For me I have been commanded to serve the Lord of this City, Him Who has sanctified it and to Whom (belong) all things: And I am commanded to be those who bow in Islam to *Allah's* Will – and to rehearse the *Qur'an* and if any accept guidance, they do it for the good of their own souls, and if any stray, say: "I am only a Warner."

This verse continues to point out the pervasive and continuous action of the same divine attributes of the formation of knowledge-flows and their induced forms.

Furthermore, there is the verse (27:93): "And say: 'Praise be to *Allah*, Who will soon show you His Signs, so that you shall know them'; and your Lord is not mindful of all that you do."

The monotonically positive relationship between knowledge-flows and their induced forms in the IIE-process, as shown in expression (2.1), can be derived from the verse (19:76):

And *Allah* does advance in guidance those who seek guidance: and the things that endure, Good Deeds, are best in the sight of your Lord, as rewards, and best in respect of (their) eventual returns.

### Systemic relations arising from *Tawhidi* world-systems

In the IIE-process methodology, the relation  $\Pi$  is thus the result of discourse, consensus and further creative evolution premised on the immutability and extensiveness of  $\Omega$  in knowledge formation. Besides, since  $\Omega$  establishes the unity of knowledge in the stock, therefore, both  $f^*$  and  $\Pi$  are derivations that carry the same essence of unity in world-systems. The nature of recreated unity in world-systems is depicted by complementary relationships between the agents, variables and their relations in all micro sub-systems of the world-systems. Among these micro sub-systems are society, economy, science, community, nations, sub-nations, the global order, self and others. Broadly speaking, the sub-systems along with their various elements are pervasively interactive within and across themselves. They thus form a cosmic order in the sense of the grand nexus of socio-scientific commons. The discourse that takes place in the essence of pervasive interaction leads to consensus in the sense of integration among the agents, variables and their relations. Systemic interaction leading to integration is the reflection of "unification" as the process of attaining

organically complementary interrelations in the light of the unity of knowledge.

Knowledge-flows exist pervasively within and across systems of relations. This is reflected by the very nature of the unification of knowledge extending across all changing nexus of the knowledge-induced world-systems. Hence, an evolutionary phenomenon is intrinsic in the evolving world-systems governed by the *Tawhidi* praxis. An explanation of this topic (evolutionary epistemology) is to be found in Campbell (1987).

Evolution from one level to another level of dynamic world-systems comes about by complementarities among knowledge-flows,  $\{\theta\}$ , and their knowledge-induced forms,  $\{X(\theta)\}$ . Evolution to higher levels of knowledge-flows appears through post-evaluation and confirmation of a well-defined criterion function, which we have termed as the wellbeing criterion function. We denote the social wellbeing function by  $W(\theta, X(\theta))$ . It is clear that each of the variables and, therefore the evaluation of this criterion function, depends upon continued affirmation of *Tawhid* in every relation that ensues. The positive evaluation of the wellbeing criterion function signifies the degree of effectiveness gained in world-systems on establishing the continuity of the circular causation and continuity model of unified reality. It bears results as it evolves from one level of knowledge acquisition to another level, until the optimal felicity is attained in the sense of completion of knowledge in the Hereafter.

About this progressive evolution into bliss the *Qur'an* declares (14:24–25):

See you not how *Allah* sets forth a parable? – A goodly Word like a goodly tree, whose root is firmly fixed, and its branches (reach) to the heavens. It brings forth its fruits at all times, by the leave of its Lord. So *Allah* sets forth parables for men, in order that they may receive admonition.

### Imam Ghazzali on the IIE-process type of organic unity of knowledge versus the rationalist perceptions of de-knowledge

In the IIE-process model, the unity of knowledge is not limited simply to the epistemological level. Rather, the essence of knowledge comprehension, reflection and the derivation of laws, rules and guidance from it are carried through to the level of application, and hence to the externalization of knowledge-flows (*ilm al-marifa*) in world-systems. Through this process comes about the conscious recognition of divine evidence (*Ayath*). Thereafter, the primal stage of the epistemology is followed by ontology. Subsequently, the knowledge-induced ontic forms emerge. These are then continuously and circularly re-originated in the IIE-process methodology, that is in the *Shurati* process. Now the dichotomy between the deductive and inductive logic of the philosophy of science, as we noted in the case







measurement of the wellbeing function. Among the variables of this criterion function are the policy and institutional ones. These imply the necessary condition of participation among agents in the underlying decision-making *Shuratic* process.

The joint result of interaction among the variables and their relations lead to the compound form of the branches of the trees configured in expressions (2.5) and (2.6). Such a compounding of mappings and relations is thus seen in terms of variables, their relations, the resulting wellbeing functions corresponding to such branches and their representation in the resulting wellbeing function. In this way, the attainment of complementarities among agents, variables and their relations signifies the meaning of integration following interaction among the entities. Finally, from the continuously dynamic nature of knowledge-flows affecting decision-making, variables and their relations, emanates the evolutionary processes of further knowledge-flows and the knowledge-induced entities of the world-systems.

The evolutionary nature of the interactive and integrative processes at each stage, as shown in expressions (2.5) and (2.6), brings out the importance of a simulation method of quantitative analysis in this interactive, integrative and evolutionary worldview. The emerging method here suggests replacement of all steady-state equilibrium points by multiple evolutionary knowledge-induced equilibriums. Consequently, optimization as a method of holding the variables in an assumed end-state of equilibrium by controlled movement in the variables, and made possible through tradeoffs among them, is totally rejected by the pervasively complementary nature of the IIE-process. Optimization cannot be an acceptable method for studying the IIE-process oriented world-systems phenomena, where continuous learning is permanently in place. Therefore, in such a model, there cannot exist any terminally attained rest positions, except in the instantaneous case of the variables and, thus, in their instantaneous relation and the corresponding decision-making among agents at moments of instantaneity. Such an instantaneous case cannot be sustained in knowledge-induced circular causation and continuity models of learning.

Besides, the presence of the unification of knowledge attained through the principle of universal complementarities and its evolutionary learning capability rejects the idea of scarcity and constriction in resource supply. Consequently, the idea of marginal substitution to be found in neoclassical economic resource allocation is negated. The circular causation and continuity model of unified reality represented in the IIE-process methodology makes risk-diversification, product-diversification, institutional development and participation among the agents, variables, resources and their relations, as the permanent consequences of evolutionary learning. Knowledge augmentation by means of new learning constantly reduces the risk and unit cost of production and investment through product-, risk- and economic-diversification in the framework of the unity of knowledge-flows as signified by the principle of universal complementarities across diversity.

### **The inter-systemic generalization of the knowledge-induced socio-scientific model**

Expressions (2.5) and (2.6) can now be extended to inter-systemic relations. The evolution of the interactive and integrative sequence of knowledge-flows and their knowledge-induced socio-scientific variables now yield a formulation for the wellbeing function that is interconnected across numbered systems in respect to the number of ensuing interactions. Furthermore, in these relations, relevant variables and their relations can be included. Thus, the expressions (2.5) and (2.6) now expand and grow in complexity but preserving order. The end result is a massive tree of knowledge, whose every branch sets forth a "pairing" relational order between different parts of the tree (nodes) and these are caused by knowledge-induction. Its fruits, leaves and other benefits denote the knowledge-induced result in the ontic form. These form the divine evidence of goodness and the causes of wellbeing.

From this complex plane of knowledge formation determining knowledge-induced forms and, thereby, the wellbeing criterion, comes about growth and the evolution of processes into higher levels of similar kinds of knowledge-induced complex relations. Thus, each branch is the result of a micro-IIE-process, which then combines and coordinates with other similar ones to form larger IIE-processes. Such interconnections may be seen as the cause and effect of extensive and pervasive complementarities among a diversity of possibilities. In the end, knowledge-flows, their knowledge-induced forms and their wellbeing function and relations, are taken into account across branches of interaction, integration and evolution. What results is a nexus of IIE-process relations, each and altogether following the circular causation and continuity model of unified reality. Such a knowledge-induced nexus is guided by the principle of universal complementarities among the diversity of socio-scientific possibilities across diverse systems.

### **The generalized wellbeing objective criterion defined**

The wellbeing objective criterion function is thus an evaluative criterion for testing the extent to which complementarities among diverse possibilities included in the function has been realized during the ensuing *Shuratic* processes. Thereby, the IIE-process model determines, by means of heuristic and empirical evaluation, the level of wellbeing attained in the learning process. Such wellbeing criterion functions are numerous across the nexus of interrelationships corresponding to the levels of the processes of world-systems, but they are complemented together according to the principle of pervasive complementarities across diversity.

According to a prior discussion on simulation as the appropriate method for studying the process nature of the IIE-model, we now note that the goal of the IIE-process model in the general systems framework is to

simulate such a generalized social wellbeing function, subject to the circularly complementary relations among the variables that are included in the wellbeing function. The resulting evolutionary aggregate wellbeing function is then a compounding of all the elementary social wellbeing indexes along branches of the knowledge-tree.

On denoting the numbered systems by  $l$  and  $k$ , with  $k \neq l$  ( $= 1, 2, \dots$ ), and interaction by  $i = 1, 2, \dots$  we obtain the detailed version of the simulation chains for the IIE-process oriented circular causation and continuity model shown in expressions (2.5) and (2.6). This is shown in expression (2.7).

$$\begin{aligned} \Omega \rightarrow_f \{\Phi\} \rightarrow_{f^*} \{\Phi^*\} \rightarrow_{\Omega} [\theta_{kl}] \rightarrow_{[\theta_{kl}]} [X_{kl}(\{\theta_{kl}\})] \rightarrow_{\downarrow} [W(\{\theta_{kl}\}, [X_{kl}(\{\theta_{kl}\})])] \\ \text{New}[\theta_{kl}] \rightarrow \Omega = H. \end{aligned} \quad (2.7)$$

The square brackets indicate the matrices of variables, relations and wellbeing functions corresponding to the  $([\theta_{kl}], [X_{kl}(\{\theta_{kl}\})])$ -entries across  $(k, l)$ -systems for given numbers of interactions  $(i)$ . The same matrix meaning applies to every monotonic transformation of the relations of expression (2.7) starting from  $f^*$  onwards except when  $\Omega = H$ , which cannot be augmented due to its super-cardinal completeness of knowledge.

Some simplification can now be introduced in the chain of relations shown by expression (2.7). The variables as shown are replaced by the limiting values of knowledge-flows and their corresponding knowledge-induced forms across diverse systems. This happens at points where interaction leads to consensus (integration) in the determination of rules and guidance and the acceptance of the results of socio-scientific evaluation by the Islamic community represented by their *Shuras*. In this way, the terminal values of  $i$  would be assigned to denote the number of interactions that lead to consensus in the  $([\theta_{kl}], [X_{kl}(\{\theta_{kl}\})])$ -values and, hence, in the formation of the social wellbeing functions.

## Conclusion

The universal truth of the divine unity of knowledge and its crystallization in real world-systems has left an abiding legacy for all generations that inquired into this praxis. Such a venture has always revealed fresh and new answers and directions to the question on the unity and unification of knowledge. The frontiers of scientific endeavor are, today, inquiring about the question of the initial condition of the universe (Hawking, 1988). Such kinds of inquiries have resulted in the project on the theories of everything (Barrow, 1991). In social theory, as in the scientific paradigm, the praxis of unifying the premise of markets with institutions and polity has proceeded with increased vigor in recent times (Henderson, 1999). The endogenous theory of institutions is notable in this area of economic research (North, 1981). However, to date, such scientific research projects

have either been purely historical narratives or have remained entrenched in the neoclassical roots of new institutionalism and social choice theory (Feiwel, 1987). Such developments have, therefore, not helped in developing a study of discourse as an endogenous structure of process governed by polity-market interaction. Consequently, a dynamic theory of preference formation and structural change and its economic and institutional consequences is unknown in an analytical version of political economy. See, for instance, Shubik's (1988) game-theoretic formalism of political economy that leaves out the dynamic nature of an interactive theory of political economy.

The theory of the unity of knowledge premised on the Oneness of *Allah* and its externalization through concrete laws into real world-systems remains a scientific research project with deep meaning. Upon this a substantive socio-scientific theory of world-systems can be established.

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### 3 An evaluation of the occidental world-system

In this chapter we will examine, most importantly, Immanuel Wallerstein's ideas regarding his concept of the world-system. This is a term that Wallerstein coined to explain both the process of capital accumulation and modernity created by the relationship between economic, social, technological and global forces within which the capitalist world-system survives. But in his recent work, Wallerstein also identifies the modern world-system with Occidentalism and shows that historicism and patterns of change in this world-system occur in a remarkably stable and pervasive way as marked by the span of historical evolution of Western civilization. The evolution of this occidental world-system is shown by Wallerstein to be a continuous threshold of fresh epistemological investigation segmented between the camps of the philosophers, the natural scientists and the social scientists since the late eighteenth-century European Enlightenment.

Second, for an in-depth study of the discursive nature of the modern world-system and its impact on the study of political economy, we will turn to selected works of James Buchanan with respect to his path-breaking theory of constitutional economics and social contractarianism. Of particular interest to us will be the examination of James Buchanan's methodology addressing the study of process-oriented problems of social contract and constitutional economics within the fold of Wallerstein's advocacy for complexity theory in the social sciences.

Between the process-oriented methodology of Wallerstein and Buchanan we will discover the missing place of a closure of the discursive method to attain dynamic equilibrium and stability within which, alone, a sustainable world-system can evolve and survive. Without this crucial property of epistemological closure, no stable and meaningful world-system for global wellbeing can be delineated conceptually and attained in real experience. The competing world-systems emergent within the capitalist and modern world of Occidentalism will thus be shown to indirectly emulate the neoclassical methodology and axioms of marginal tradeoff that characterize optimal and steady-state market resource allocation under rational choice. In the case of social contractarianism and constitutional economics



we will argue that the same neoclassical perspective is imported to explain competing as opposed to co-operative behavior within an institutional framework.

Our critique of the polity-market interaction in the occidental world-system in both Wallerstein and Buchanan's sense will lead the way to the role that the discursive methodology of the IIE-process plays in a reconstruction and realization of a world-system with complexity within unity in it. This is also the same as the principle of pervasive complementarities across a diversity of systemic entities that we have explained earlier. Here, the knowledge-induced worldview of unity of knowledge will be shown to lead the way to the criticism and a revolutionary awakening in the academia of socio-scientific inquiry and its interface with the real world.

### **Immanuel Wallerstein's world-system theory**

Immanuel Wallerstein argues that the long-staying nature of the capitalist world-system as characterized by its global economic, geopolitical and technological evolution, was due to the permanent nature of the relationship between capital accumulation and technological change. The coming of this age is seen as the result of an epistemological debate and evolution out of the theological metaphysics of the eighteenth-century Schoolmen. This transformation came about, first, by independence of the philosophical school that took to rational arguments. Second, the occidental intellectual tradition further evolved and departed into supremacy of the scientific revolution of the age. Third, beyond that still, in the nineteenth century one finds the rise of the social science school as another dichotomous development, separate from the natural sciences, but emulating and importing the empirical and quantitative groundwork of scientific inquiry within the disciplines of the social sciences. This flair for empiricism and independence between the disciplines led to further fragmentation of the social sciences in recent times. Such a dichotomous fragmentation now poses a questionable development as to the convergence of knowledge and what pattern it will take to reinstate unity of knowledge between the existing competing disciplines.

Wallerstein's capitalist world-system, emulating the intellectual reflection of the age of post-European Industrial Revolution in the late eighteenth century, can be seen as a process of relationships between capital, markets, technology and institutional governance of the political economy. The methodology used in this recursive relationship between the components is the one that segments the disciplines in the name of independence of its systemic hierarchy. Competition and hegemony between the disciplines mark the momentum of evolution of knowledge in this state of dichotomous and competing developments of knowledge. Unity of knowledge by a discovered and acceptable methodology remains absent. Thereby, the intra-systemic relationship between capital accumulation, economic and

political power, as expressed and exercised in the capitalist market order and institutions, is perpetuated by the foundational axiom of conflicting behavior.

The continuation of this kind of recursive relationship over a long period of time in Occidentalism, explained by Wallerstein as the premise of its staying stability and equilibrium of the capitalist world-system, is therefore a carrier of a multitude of epistemologies of dichotomous, competing and independently evolving systems within the capitalist world-system. The capitalist world-system as explained by Wallerstein (1974) is, therefore, deeply epistemological in its own right according to the descriptions of independence of pervasively competing systems defining the relationships between capital accumulation, political and social order, technology and the market order.

Wallerstein (1998) calls this long-run pattern of evolution of the capitalist world-system its *Eternal TimeSpace*. He refers to the similar kinds of developments within the segmented disciplines of the capitalist world-system as the short-run *Episodic Geopolitical TimeSpace*. Thus, the large-scale capitalist world-system is replicated by its plethora of intra-systems. Vice-versa, the small-scale intra-systems define the long-run character of the capitalist world-system. Such a systemic embedding marks the cause and effect of the evolutionary character of recursive relationships and movements in the capitalist world-system.

Wallerstein uses the *Episodic Geopolitical TimeSpace* to explain episodes of particular events in the geopolitics of space and time, hence the caption *TimeSpace*. The two are combined into one because of the claimed continuity of the episodic particularity. The *Eternal TimeSpace* is Wallerstein's domain of generalization over which the entirety of the episodic events and systems evolve while maintaining their character of competition and independence. Generalization of results and trends in Wallerstein's world-system are thus a bundle of particularities, just as the totality of the anthropological evolutionary process is seen in the Darwinian sense to be spanned by the continuous mutation of mutual selections by competition and independence.

Wallerstein's conception of the world-system is deeply premised on rationalism, meaning the sole commencement of knowledge from the realm of the human mind and materiality alone. There is no further reduction of these roots of the epistemology to any more fundamental axiom, such as the divine law. Wallerstein had unequivocally rejected this possibility in his construction of the episteme of the modern world-system. In this regard he writes (1998, p. 44):

The process of creating the modern world-system, a capitalist world-economy, involved (necessarily involved) an effort to break out of the constraints imposed by this clerical monopoly. Enter the philosophers, or rather re-enter! The two great movements of ideas we associate

with this period in which our world-system was born are the Renaissance and the Reformation. Both involved the assertion that truth can be ascertained directly by human beings, in one case by insight into the natural laws of the universe, in the other by insight into the mysterious ways of God. But in both cases, truth was ascertained on the *de facto* authority of the one who had the insight, and in theory everyone might have such insight, or at least it was not an option that was linked to holding some office.

Wallerstein emulates von Mises (1960) in the latter's stand that the ultimate epistemology of economic science is premised on reason. The praxis of historical materialism as the indicator of change and economic explanation is denied as a viable premise of scientific reasoning in economics. This stand was held as a criticism of Marxism, which believed in the historical dialectical process as an indicator of the inner contradiction of capitalism. The Austrian School of Economics championed this kind of criticism.

In their rationalist epistemological views, both von Mises and Wallerstein were exponents of the neoclassical school, an economic and scientific theory that is deeply entrenched in the praxis of economic rationality and deductive reasoning as the primal sources of deriving axiomatic economic truth. The extension of an unbounded rational choice idea to institutionalism formed the neoclassical basis of institutional behavior, in what came to be known as public choice theory (Buchanan and Tullock, 1999) and the political economy of political cycles (Nordhaus, 1975; Srinivasan, 1985).

Unlike the neoclassical economic predeterminism of rational choice, Wallerstein's Eternal TimeSpace is not predetermined. It is constructed according to the reasoned flight of the mind into dialectical behavior. If this is a correct explanation of reality, then the invariant laws of nature and historical movements have no permanent meaning in the Eternal TimeSpace. The axiomatic basis of any irreducible fact, such as the principle of divine unity and its reflection on systemic unity in the scheme of things over space and time, has no validity. Wallerstein's epistemology here reflects the meaning of the words given by Gray (quoted by Blaug, 1968, p. 3) respecting economic science:

Economic science, if it be a science, differs from other sciences in this, that there is no inevitable advance from less to greater certainty; there is no ruthless tracking down of truth which, once unbarred, shall be truth to all times to the complete confusion of any other doctrine.

Consequently, the place of God in Wallerstein's world-system remains an interpreted case of reason alone. God cannot be the Giver of permanent and predetermined immutable laws that do not change over space and time. The divine laws are subject to interpretation and understanding by rationalism at every moment of existence. I once questioned Immanuel

Wallerstein at his keynote address to the Society for the Advancement of Socio-Economics in the University of Geneva, Switzerland, regarding the place of divine Oneness in his philosophical model of complexity, in which he discards the assumption of fixity of certain irreducible axioms. The answer I got was that even such an axiom remains variable in Wallerstein's complexity theory. Hence, God in Wallerstein's world-system is not an irreducible fact of perfect unity. In any system that remains unbounded in the large-scale universe, which is Wallerstein's Eternal TimeSpace spanned by Episodic TimeSpace events, a perfect disequilibrium worldview must prevail. This would render Wallerstein's complexity theory unstable and disequilibrium paradigm in delineating his conception of the world-system.

Rationalism in Wallerstein's thought relating to world-system also reflects Popper's falsification hypothesis, a continuous refutation and consequent evolution of science as a system of refutable truths. Wallerstein (1998) extends the refutation hypothesis to the axiomatic premise of a scientific theory. He has, thus, propounded his conception of complexity theory. It is a theory based on the complex emergence of world-system through conflicts, refutation and unstable or moving equilibriums, which ultimately tend to become bifurcating and, thus, disequilibrium points of episodic departures within the Eternal TimeSpace. The world according to Wallerstein is not only complex in this sense but, also, he believes that the task of science is not to reduce this simplicity; the task of science is simply to explain complexity. Wallerstein explains his "orders" of Episodic TimeSpace as moments of "chaos" from which emerge fresh "orders" of the world-system. But Wallerstein considers these events of orders with chaos as being perpetually perturbed and "constantly regenerated."

### **Wallerstein's "cyclico-ideological" TimeSpace within the Eternal TimeSpace**

The last observation on Wallerstein's theory of the world-system leads us to inquire whether his theory reflects any element of the IIE-process despite the open-ended universe, without a reducible convergence, as noted above. Wallerstein's complexity theory revolving around the perpetually perturbed events of the Episodic TimeSpace domain within the Eternal TimeSpace entirety implies that there are event nodes for the continuous reproduction of such events in historical time, but they do not have uniformity of occurrence. Every conceivable and unpredictable variation can happen over TimeSpace. Thus one can deduce from this that Wallerstein's epistemological framework does explain cyclico-ideological events but with no convergence, by virtue of his open-ended universal conjecture of the type formalized by Popper (1965). It is, therefore, difficult to understand the cyclico-ideological processes within the theory of the Eternal TimeSpace. If convergence is replaced by bifurcation, as in a Darwinian parental model



of multitudes of evolutionary anthropological natural selections, and a closed universe by the axiom of irreducibility of a final terminal knowledge is not allowed, then the Eternal TimeSpace remains open and unbounded. In such a universe there can neither be stationary nor well-defined evolutionary equilibriums marking what Wallerstein would like to call transformational stages of world history and civilizations as great moments of human advance.

The above observation is a mathematical fact established by any of the following theorems: Rolles' Theorem on the expansion of an analytical series by Taylor's Theorem (Widder, 1961) requires boundedness. Brouwer and Kakutani's Fixed Point Theorem (Nikaido, 1989) depends on the mapping of a mathematically closed and bounded set (compact set) into itself to establish the existence of equilibrium. Evolutionary equilibriums over unbounded domains but bounded within the total bounded large-scale universe are studied by certain perturbation methods. This last category forms an important class of knowledge-induced evolutionary equilibriums (Choudhury, 1993), knowledge and evolutionary equilibriums (Osborne and Rubinstein, 1994), punctuated equilibriums within a bounded large-scale universe (Prigogine, 1980) and the global capitalist order (Thurow, 1996). The inflationary universe theory of theoretical physics, which would finally lead to a flat curvature or a Big Crunch for the universe presents a feature of the very large-scale bounded universe (Hawking, 1988). Another very powerful example of the bounded nature of recursive refutation can be found in Godel and Tarski's Self-Referencing Theorem (Smullyan, 1992).

Only in Marx's overidentified model of causality, in which no entity is independent of another, has a picture of an unbounded epistemological universe been presented (Resnick and Wolff, 1987). Such a circularly inter-related system is unsolvable unless at least one variable or relationship is held exogenous to the system under study in the Episodic TimeSpace. In econometric models, such relationships are called exogenous or lagged relations. They are necessary to introduce predictive power and manageability to the models. In the Walrasian economic system, the monetary *numeraire* is considered as the exogenous variable for solvability of the multi-market system. The Walrasian general equilibrium system, with the number of variables being more than the number of equations, was formalized by Choudhury (1992). Rawls' discursive model of the minimax game played across evolutionary space, was closed by Wolff (1977) by considering certain terminal games in the game-theoretic approach to social contracts.

### **A brief contrast between the IIE-process and the TimeSpace world-system**

Thus, in the end, we note that predictability, controllability and solvability of any system, even within an Episodic TimeSpace framework, requires

either a bounded feature of the domain of action or an evolutionary unbounded domain embedded within a large-scale closed and bounded domain. In the latter case, we get stable, predictable and controllable evolutionary equilibrium points induced by discursive behavior extended to both agency-system interaction as well as a study of inter- and intra-systemic relationships. Even complexity theory, which is an appropriate feature of world-system interrelationships, can be studied by such kinds of cybernetic models with order within perturbations. Such complex models have been applied to social systems (Johannessen, 1998) and pansystems cybernetics (Xuemou and Dinghe, 1999).

Wallerstein's cyclico-ideological process methodology is, thus, different from the IIE-process methodology based on the two different approaches and, therefore, consequences, of these models in the socio-scientific field. These are caused by the non-convergent nature of complexity models in Wallerstein's open-ended universe, as is the case also with Popper's refutation hypothesis and Darwinian mutation in the intergenerational tree of mutual selections. On the other hand, the IIE-process methodology leads to convergent and evolutionary behavior of systems across open sub-systems of a bounded and complete large-scale universe. This we had explained by the universal trajectory, "*Tachid* in the primal to *Tachid* in *Akhira* through the processes of the world-systems."

### **Institutionalism and behavior in non-convergent complex world-systems**

#### ***Older political philosophy reflected in Wallerstein's world-system***

Wallerstein's delineation of the modern world-system and the capitalist world-system is an epistemological replication of an abiding praxis on which he discerns the transformational epochs of Occidentalism through conflict and innovation, having no convergence in the complex inter-relations between diverse systems that characterize behavior within modernity and capitalism. Such a worldview is not new among the occidental thinkers. Schumpeter (1962) along with the Austrian School of Economics, principally Hayek (1945) and von Mises (1960), thought about a similar methodology of "creative destruction," characterizing the rise, decline and onward replication or revision of existing patterns of relationship between enterprise, technological innovation and capital formation. The result was explained in terms of the rise and fall of socialism and, also, of the rise, continuity, but possible decadence of, the liberal democratic and capitalist order (Sullivan, 1989).



### ***The problem of organization and social choice: the neoclassical deepening***

The political economy of institutionalism is based on the behavior of conflict and self-interest. These are driven by competition between powerful groups who, through such competition, allocate power in an efficient way, according to the parlance of rational choice. In relation to such behavior, institutionalism is defined as the organization of the economic rational choice theory driving group dynamics and organization for maximizing self-interest and economic gains. In the capitalist world-system, an organization, be it economic or otherwise (e.g. the Church), is seen to define the structure of institutionalism. Such a relationship between organization and institution is explained by Arrow (1971, p. 224; also see Arrow, 1974):

An organization is a group of individuals seeking to achieve some common goals, or, in different language, to maximize an objective function. Each member has objectives of his own, in general not coincident with those of the organization. Each member also has some range of decisions to make within limits set partly by the environment external to the organization and partly by the decisions of other members.

Earlier, Simon (1955) explained the definition of organization in terms of discursive rules within an institution formulated by its group members and simulated by repeated checks and balances to maximize the economic and political gains of the institution.

To Arrow's definition of an organization, Whittaker (1987) has given a criticism noting the absence of rules in Arrow's definition. This is to say that the actual processes underlying organizational behavior toward maximizing economic or political objective function remain absent in Arrow's definition of organizational behavior and his maximization objective function. The matter of self-interest and maximizing behavior is further complicated by the presence of multiple objectives in the institution's organizational life, the most reduced ones of which are economic and political, but should also extend to social objectives as well. In the presence of such multiple objectives, Arrow (1951) formulated his theorem of the impossibility of maximizing the social welfare function in social choice theory. But in order to apply the axiom of maximizing behavior as the standard of neoclassical economics, Arrow has to introduce a dictator into his social welfare function, so that this dictator as a governing authority, introduces a conduct of behavior that is imposed and leads the organization to its Pareto-optimal state. There could exist more than one point of such Pareto-optimality in the political, economic and social resource allocation problem. From these points, the neoclassical organization of Arrow's type chooses what is called the bounded upper semi-continuous limit of the maximal

social welfare functions for different sets of the Pareto-optimal points (Debreu, 1959). The method results once again to one of selecting a particular optimal point from the various Pareto-optima arising from the application of rational choice theory (Choudhury and Korvin, 2002).

An incisive criticism of the neoclassical basis of optimality governing institutional and market behavior can be found in Shackle's (1971) work. The assumption on the existence of market equilibrium in classical and neoclassical economic theory is argued to involve an infinite number of commodity market clearances between atomistic buyers and sellers which, if they were to be truly carried out, would take a lifetime. In Shackle's (1971, p. 150) words:

When we examine this suggestion, we see that it is no more than a formal acknowledgement of a problem, the problem of how (by what institutional arrangement, by what organization of affairs) the equilibrium prices are to be discovered. Repeated trial and error, while the market stands in suspense awaiting the outcome, is not a practical resort. The number of distinct trials, even if confined to discrete steps of price and quantity, would be so immense that the necessary "market day" would extend beyond human lifetimes.

Here, too, we note that the neoclassical economic theory of an entrenched behavior between markets and institutions pervades the entire structure of political economy of the neoclassical state, as North (1981) has observed. What we find is a historical datum of the conflicting and competing behavior of self-interested individuals defining their preferences of methodological individualism in liberalism. Such long-run sustaining of behavior and the preferences of methodological individualism have led occidental political economists to premise all behavior on rational choice, competition and self-interest. The philosophy of such an overarching design of individual behavior and institutionalism, be it in society, economy or science, came to be known by the term "liberalism" as the foundation of Western social contract (Minogue, 1963; Hayek, 1967).

### ***Democratic institutions and methodological individualism***

In the theory of democratic institutions we find an equally troubling dichotomy between the value of freedom and liberty and the claim of these by the supremacy of the individual, and group hegemony gained by virtue of economic and political power. This problem of political philosophy was pointed out a long time ago by Rousseau, whose critical words against individualistic and group hegemony of democracy bring out the untenable notion of collectivity in a democratic institution and political system. Rousseau (trans. Cranston, 1968) describes individualism as the

basis of civil libertarianism in his bizarre, but happily ending, example of the magic cutting up of a child into pieces and then by a sleight of the hands combining the pieces together once again. In other words, a meaningful social contract in democracy must have a theory of aggregation of preferences in which the addition of such preferences becomes possible. Yet, like the Japanese magician's example given, there is only a lateral aggregation of will and preferences in a theory of democracy. Such an aggregation cannot yield a substantive theory of the social choice. Rather, social aggregation is such that the aggregate social will would bring about benefits greater than the addition of independently constituted individual preferences.

Democracy as a political institution, and its supportive economic superstructure capitalism, are both governed by the aggregation of preferences of self-interested profit-maximizing individuals or groups in both the political and economic sense of material gains and power. There is a long-standing debate on the topic of whether democracy looks after the interest of human liberty and fraternity (Raphaël, 1990).

On applying the theory of aggregation of politico-economic preferences, that is, preferences that present the coterminous result of self-interest prevailing in the economic and political fields as supportive systems of each other, we note a particular kind of aggregation theory of human liberty. That is, human liberty now gains its meaning from natural liberty, which is construed in classical political philosophy as being perfect in the state of nature. Upon such perfect natural liberty states the political liberty espoused by this classical theory of democracy is seen to be the aggregation of the perfectly optimized preferences based on individual liberty.

#### **Adam Smith and the classical economic school on natural liberty and the market process**

Likewise, on the economic front, Smith construed such a conception of natural liberty when applied to the minimal state, as perfect freedom in the state of nature, wherein every individual remains perfectly free (Smith, reprinted in Campbell and Skinner (eds), 1976). From this construct of the Smithian political economy emanates the theory of laissez-faire or non-intervention. Consequently, with the introduction of an aggregation theory of self-interested and perfectly optimal preferences in the sense of unbridled freedom, Smith's form of government and the state became socio-political artifacts for maintaining the methodological individualism of perfectly free and unrestrained individuals in a state of natural liberty. The moral sentiments lost their socially caring meaning between Smith's *Theory of Moral Sentiments* and his evolution of ideas of a market economy in the *Wealth of Nations*. The latter work saw society liberated and freed of state intervention except in the question of protection of the natural propensity of liberty (Coase, 1994; Choudhury, 2000). The civil libertarian

order replicated the individualism and laissez-faire attributes of natural liberty in terms of their social constructs.

A theory of lateral aggregation of optimal individual preferences to construct social aggregative preference was espoused by Jeremy Bentham too, within the tradition of civil libertarianism in the classical school of political economy. The legacy of civil libertarianism is still deeply entrenched in today's new classicism that calls for minimal state intervention while promoting maximal functioning of the market economy (Nozick, 1974). Even in the case of individual ethical preferences, a theory of moral consequentialism of the Harsanyi-Bentham type forwarded by Hammond (1987) reflects the independent and exogenous role of ethical preferences in the construction of social preferences.

#### **The problem of social preference formation in Nozick's case**

In Nozick's case, the social welfare function, as an aggregation of individual utility functions defined in terms of critical state and market variables and policy instruments, can be seen to replicate an ideal neoclassical idea of optimal resources allocation. Now the socio-political goal of redistribution, as by a specific tax on target groups, ceases to sustain a social meaning in favor of an efficient market allocation of resources for the common good, as opposed to being an ethically driven socio-political distribution of resources. Nozick considers such forms of distribution to be "morally abhorring." He therefore builds his socio-economic entitlement theory on the basis of a minimal-state concept and would like to determine his resource allocation theory on the premise of ownership of wealth by one who gets it from the original state of nature. This, in other words, is a version of the natural liberty concept of the classical vintage now applied to the socio-political venue. Ownership is now thought of as a primordial acquired right in the state of nature attained without coercion of any kind, even that of the state or the benevolent despot.

#### **Recent utilitarian problems of preference aggregation**

Hammond's formal version of Harsanyi's Benthamite type social welfare function in "ethical liberalism" is a weighted aggregation of individual ethical utility functions in what is termed as the *fundamental individual norm*. The individual social welfare indexes that are laterally aggregated into the "*fundamentally utilitarian* social welfare function" show two properties that are characteristic of altruistic methodological independence and individualism. First, the personal attributes to which belong the altruistic preferences remain independent of the market consequences in a Cartesian product space of the "consequentialist norm." Second, the von Neumann-Morgenstern (Neumann and Morgenstern, 1944) type expected individual



welfare indexes are linearly, hence independently, aggregated by the weights of ethical liberalism. As argued above, such weights of ethical liberalism can be derived from the pure state of nature where natural liberty defines the optimal human preferences of perfectly free individuals or, as in Arrow's social dictator, can be predetermined. In either case, a predetermined optimal prescriptive behavior defines the spectrum of the lateral aggregation methodology in the political economy of ethical liberalism.

### ***The problem of institutionalism in the political philosophy of democracy***

In the end, we note that there remains the deeply entrenched problem of the political philosophy of democracy both in its earliest Greek and classical perspectives and its latter-day neo-liberal developments. Raphael (1990) characterizes this problem as that of discerning the limits of fraternity and participation in democracy as opposed to the focus on fraternity in favor of equality by the principle of perfect liberty in socialism. The combination of these two principles is experimented in social democracy, wherein participation is upheld. But because social participation proves to be costly for the state to oversee and regulate, there is an inevitable build-up of powerful states and groups that maintain power and authority despite their election by the common democratic franchise. Raphael brings out this problem of a neoclassical type tradeoff between social distribution and economic efficiency in view of the attribute of self-interest. This is yet another pervasive example now found to exist in the political philosophy of democracy. Raphael (1990, pp. 86-87) writes:

Within the Western conception of democracy, we may say that democratic socialism emphasizes equality and fraternity, and is apt to lay less stress on liberty than do liberalism and conservatism. Modern democratic socialism also shares with communism a doctrine of economic organization. It accepts the Marxist thesis that the way to reach social improvement is to abolish certain (not all) forms of private property . . .

### **Social contractarian ideas of constitutional economics according to James Buchanan**

The polity-market interaction between the economy and various forms of political arrangements that support a particular mode of market behavior referred to above as consequentialism (Sen, 1990), results in the study of political economy. Preceding the epistemological perspective of world-system theory according to Wallerstein, another prominent model of polity-market interaction has been forwarded by James Buchanan (1999a) and Buchanan and Tullock (1999). In this section we will investigate the

social contractarian ideas of their constitutional political economy as an extension of the political philosophy of democracy as it interacts with the market order and with individual and social behavior in the midst of ethical market consequentialism (Sen, 1985).

What is the nature of constitutional economics and of social contract theory according to it? James Buchanan, like Arrow, has stood by the altar of individualism as the basis of all human action and organizations. In his economic theory of democracy (1999a) Buchanan points out the essential link between a free market ordering and the behavior of self-interest that finds its expression both within such markets and the institutions that are causally linked with the market process. To Buchanan, social choice and the social welfare function can be meaningfully defined in the democratic system only if the rationality and consistency assumption of order ranking and additive individual utilities underlie the construction of the social criteria. Contrarily, it is argued that the social welfare criteria cannot mold the behavior of individuals. In this regard, Buchanan defines social rationality simply in terms of the rationality conveyed to a social organization and decision-making by the collectivity of individual rationality each acting on its own self-interest grounds of maximizing individual utilities. He argues that if, conversely, the social welfare criteria are used independently to convey any notion of social rationality, then the underlying methodology reflects values other than individual values. Consequently, the foundation of a democratic society that so vehemently promotes individual values would be annulled by such a collectivist meaning of social rationality according to the yardstick of the social welfare criterion. In this regard Buchanan writes (1999a, p. 94):

If social rationality is defined as producing results indicated as rational by the welfare function, that is, maximizing total utility in the utilitarian framework, a market decision is socially rational only if individuals are rational and individual utilities are independent. A voting decision is socially rational only if individual voting power is somehow made proportional to individual utility.

In his ethics of constitutional economics, Buchanan (1999b) admits that the sole objective and capability of this field is simply to study human institutions under the individual premise of decision-making. Therefore, in constitutional economics, individuals are seen as choosing between constraints of the problem of maximizing the additive social welfare function. This is a problem very similar to Hammond's on the utilitarian ethics of social welfare of the Bentham-Harsanyi form mentioned earlier. The difference between constitutional political economy and the usual economic theory is this. Constitutional political economy equates institutional preferences to a mathematical union of individual preferences premised on Kantian type rationality with consistent value-ordering. Such an aggregate



institutional preference then imparts to institutions the same kind of behavior of rationality, consistency and maximization as in the case of individual preferences. Buchanan admits that the domain of constitutional economics is not to tackle the problem of extraneous human behavior prompted by lineage to religion, cultural norms and ethical and political forces. Buchanan's constitutional ideas of social co-operation in exchange relations against the conflict nature of relations in politics, introduces an altogether new dimension in the economic theory of democracy and its relationship with the market order and constitutional ethics. We want to examine this topic briefly here to bring out the nature of social rationality in Buchanan's rational choice theory at the level of institution.

One finds an obvious contradiction here between ethics as based on morality and the ethics of democratic behavior premised on the principle of natural liberty and formed by individual choices and actions as the social rule. An example is taken from Buchanan himself (1999c), which may elaborate this point further; though a person may morally oppose prostitution yet he would not mind this trade to be practiced in society because of the feeling that the partners concerned have free choice to the trade. In this way, by extension of the example, the great issues of moral consequentialism and choices in the market order lose their otherwise complementary relationship, when the institution of democracy reigning on the principle of natural liberty as a distribution of individual voting rights, enforces social rationality despite some of its abhorrent contradictions between individual values and social choice by ethics and morality.

The other case of contradiction in the ethics of individual values and democratic institution is that of "irrelevant preferences" in social choice, which means the withholding of preferences of a minority group in a democratic choice making. How is the relevance of minority preferences determined in a democratic social choice according to the principle of "irrelevant preferences"?

The rule of majority as the reflection of the aggregate of individual rational preferences can result in a glaring departure from the protection of minority preferences. In recent times such cases have arisen from the denial of the United States Government to accord legal right to the prisoners of the Guantanamo Base, despite the international demand for the protection of such rights according to international law governing the rights of prisoners of war. The American democracy also ignored the due process of consultation with the United Nations to attack Iraq with the intention of coercively removing Saddam Hussein from power. In such cases, we find that the due course of law and order according to international law is denied to a minority. The latter's preferences become irrelevant within the collective preferences of American democracy by assigning a weight of zero to minority preferences. Buchanan's constitutional economics and his stalwart support of the ethics of democracy based on individual rational choice imports into institutions, such as the government, a rule of hegemony

and absence of moral consequentialism, despite invoking the utilitarian ethics of methodological individualism in the name of natural liberty and self-interest.

The lateral aggregation of individual preferences in formulating the social welfare function of a democratic state and institutions by leaving out irrelevant preferences, establishes a form of "dictatorial" position that enables the social welfare function to be maximized. This is Arrow's social choice perspective on the "possibility theorem" of social choice theory for optimizing the social welfare function. In the case of Buchanan, too, the existence of optimal social welfare is defined as the lateral aggregation of individual utilities, as also in the Bentham-Harsanyi case. In the case of optimal social welfare and social choice this must imply that all individual choices and preferences are, respectively, in their states of Pareto-optima. Buchanan thereby defends the theory of Pareto-optimality in his constitutional economics (1999d).

The whole of the occidental social contractarian thought is riddled around this unique question: What is the basis of social choice formation? The implication is one-way, that is, from the aggregate of individual preferences and rational conceptions to an equivalent idea of what constitutes the social good. The other implication here is what Buchanan rejects as dysfunctional in the formation of constitutional behavior, that is, the control of a social monolith over individual behavior and preferences. Within this socially imposed implication, in either case of the natural liberty and equality, the social good is shown not to be distributional but allocative in nature. The public good is allocated by marginal substitution between the alternatives of market-determined forces prevailing on methodological individualism and the ethical goal. Here is where one fails to understand how Buchanan's constitutional economics can be considered as explaining co-operating, as opposed to conflict behavior, in establishing social rationality. In other words, a tradeoff notion of competition between alternatives is equivalent to a competition between the agents that hold such alternatives. In the same way, competition between the institutions of production, consumption and distribution are used to maximize the lateral aggregation of self-interested preferences of competing groups of different asset-holders.

Social contract, according to Kant, was of the nature of the social monolith governing the individual moral will. Hume (1992) thought of relating to the sensate world of perceptions and forms as the premise of reality. The formation of social preference by the aggregation of individual preferences is of a Humean type defined by the individualistic rule of social contractarianism (Buchanan, 1999e). The history of occidental thought on social contractarianism and moral consequentialism has permanently been entrenched and deepened in the dichotomy between deductive reasoning *à la* Kant and inductive reasoning *à la* Hume with respect to social reality. In the midst of this partitioned view of reality, a precise understanding of the moral good is lost in the mire of individual rationality and the absence

of causality between the deductive and inductive reasoning, between the individual and the social whole, between morality, ethics and sheer market consequentialism (Sen, 1985).

### **Examining the occidental world-system and social contractarian philosophy by means of the methodology of unity of knowledge**

#### ***Perpetual dichotomy of praxis in occidental roots of science***

Wallerstein's world-system is a monolith of complex relations. The dynamics of Wallerstein's idea of complexity are caused by competing and conflict groups on opposite sides of the social spectrum. Such groups can be individuals, agents or countries. On the other hand, Buchanan's constitutional economics is a social system with individual values and preferences as the fundamental building blocks of the social choice and welfare function.

We ask the question: If we consider the social system as an example of the world-system, then how do the viewpoints of Wallerstein and Buchanan correspond with each other? In other words, is there a unique praxis that can explain these two disparate social systems together? If this is not possible, then the two methodologies become dichotomous and the unity of knowledge between systems of thought and their implications is lost.

In Wallerstein's words (*italics mine*) the character of the post-modern world-system is one of perpetual chaos and perturbations. These epochs are marking the transformation into the structural TimeSpace:

*It (post-modernity) is the moment of transition from one kind of historical system to another, from one mode of organizing social life to another. These moments do not come often. They come only when an historical system has exhausted its mechanisms of re-equilibrating itself, has used up the efficacy of the cyclical rhythms, has gone sufficiently far from equilibrium that the oscillations have become relatively wild and unpredictable. We enter then into the moment of which Prigogine speaks, the moment of bifurcation in which a new, but nonpredictable, order will emerge from the chaos into which the structure has acceded.*

The transformation to such a structural TimeSpace order out of chaos also invokes a methodology of complexity which, according to Wallerstein, is marking the rise of an epistemological revolution. Yet the emerging orders in Wallerstein's transformation in the structural TimeSpace context are essentially without stability or stable equilibrium. They are "loci of chaos" out of which new repetitive orders are constantly created in continuum.

Such a characterization of the epochal transformation in the post-modern equivalence of world-system theory destabilizes the stable, optimal and lateral aggregation of rational individual preferences of Buchanan's social rationality in his social contractarian praxis. Consequently, the theory of the social order and its praxis as a world-system according to Wallerstein remains opposed to that of Buchanan's social contractarianism. A methodological dichotomy prevails between the contrary ways of defining a meaning of social reality that remains evasive in these polar domains. Unity of knowledge, as a methodology explaining the nature and working of different systems in a unique way, and which can make systems converge methodologically and, thereby, institutionally across markets and polity, is distanced away from social reality.

This is a disabling consequence not simply of Wallerstein and Buchanan's social orders but also of the entire methodology that is premised on methodological individualism and its non-compliance with the possibility of accepting the final irreducibility character of a certain ultimate axiom. Such an ultimate axiom invokes the primal truth of God and, with it, the synergy of the divine laws in analytical reasoning and social action within world-systems. It is precisely the absence of this critical premise of axiomatic irreducibility, and the ineluctable surrender to accept divine reality within the conscious universe of mind and matter, that partitions the human view of an otherwise perfectly unified world-system.

#### ***Edmund Husserl on unification of scientific knowledge***

One of the glaring discontinuities in methodology is the dichotomy between deductive and inductive reasoning as mentioned above between Kant and Hume. The project on unifying the two aspects of an otherwise unified reasoning on reality was tried by Husserl (trans. Cairns, 1977) in recent times in his project on phenomenology. The project was based on the philosophical argument that reality is explainable exclusively by the combination of what is real and apparent in the realm of experience. Experience itself is defined as the unified representation of the inner and outer experiences. That is of body and mind, of noumena and phenomena. Yet these altogether arise from the realm of knowledge that is independent of the internal reference to God as the divine authority of knowledge in the world-systems.

The project of phenomenology failed to bring about its much-desired unification between the experiences of noumena and phenomena because of the same debility of not being able to incorporate the divine precept at its foundation. In regard to unification of the epistemological and ontological foundations of knowledge in his project on phenomenology, Husserl rejected the externally given object of complete, perfect and absolute knowledge, that is God's.

Hammond *et al.* (1991, p. 93) point out how Husserl thought about the possibility of knowledge (emphasis added):



Husserl objects to this division (*Kantian division between noumena and phenomena*) between a world which can be known and a world which cannot be known. Like Kant, Husserl rejects the idea of what transcends all experience as a possible object of knowledge, because it is impossible to experience; but, unlike Kant, he wants to eliminate such a concept from having any role to play in knowledge.

Even so, in Kant too, we found the failure of methodology to unify the *a priori* and the *a posteriori* realms of knowledge into a cohesive whole. This is the problem of synthesis in Kant's heteronomy as pointed out by Carnap (ed. Gardner, 1966), which was mentioned earlier.

There is the well-known quote from Kant (trans. Friedrich, 1987, p. 25) in regard to this dichotomous way of reasoning:

In what follows, therefore, we shall understand by *a priori* knowledge, no knowledge independent of this or that experience, but knowledge absolutely independent of all experience. Opposed to it is empirical knowledge, which is knowledge possible only *a posteriori*, that is thorough experience. *A priori* modes of knowledge are entitled pure when there is no admixture of anything empirical.

Again, in reference to Wallerstein's complexity methodology in the social sciences, the points of deductive and inductive reasoning can be interpreted as dichotomous bifurcations of a tree that falls apart and then grows into two or more distinctly rooted trees, each with its own independent, but weaker, existence as the similar process of dismantling and bifurcation continues. Such bifurcations and independent organic growth can be interpreted analogously to the process of individuation caused by methodological individualism. But, yet, the aggregation of these independently individuating units is not the same as the original monolithic whole. Thus, depending upon which way the inequality weighs between the monolithic and individualistic social determination, the resulting social contract sways permanently between the leviathan (monolithic) and anarchy (methodological individualism devoid of social meaning). A profound bifurcation in the thought, life and experience of the social order is, thus, permanently entrenched in the dichotomous and pluralistic preferences of agency in the occidental order.

### Complexity theory and the IIE-process

Wallerstein's complexity theory is addressed to explain major transformations caused by cyclo-ideological structural transitions, and these are seen to be occurring very fast. The same kinds of biological perturbations and punctuated equilibria in institution-economy relations, have also

been pointed out by Thurow (1996). We are, therefore, curious to examine whether Wallerstein's cyclo-ideological movements of history reveal any aspect and substance of the IIE-process of unity of knowledge taken up in the divine fold, which we have explained in the earlier chapters.

By the nature of stability and balance conveyed by the divine law and its action and response in the organization of world-systems (*Alamien*), perturbations occur in the evolutionary framework of the knowledge-based worldview, not by chaos and disequilibrium dynamics. Rather, learning in such perturbations occurs by virtue of diversity of choices that are governed by the actions of interaction and integration both within an institutional framework and in the socio-scientific order. In the special case of the economy, the choices are determined by consensual preferences formed by the interaction between markets and polity under the impact of guidance, policies and instruments in it. In this way also, the individualism of the social contract is replaced by causality between the agents and the social order through the process of learning between the individual and the institutional collective with which the individual shares its knowledge. This is the essence of the *Shurati* process, which we have explained as being equivalent to the IIE-process.

Rational behavior in resource allocation, shown by the tradeoff between alternatives in the individual utility functions and, thereby, between preferences both at the individual and social levels, are replaced in the IIE-process methodology by non-linear aggregations. Such a preference aggregation is determined by pervasively complementary interrelations between polity-market variables and institutional agents. A disequilibrium signifying perturbation mechanics is, then, absent. Instead, the knowledge-induced dynamics of evolutionary equilibria over fields of integrated circular causality between knowledge and the knowledge-induced forms, between the deductive and inductive reasoning in the epistemic-ontic framework (Choudhury, 1994), remain pervasive. This is the strongest sign of the unity of knowledge according to the *Tawhidi* worldview of systems, as explained in earlier chapters.

### Conclusion

After traversing some of the principal building blocks of social contract and constitutional ideas of institutions and the nature of the social orders, we are led to the ineluctable conclusion. There is a profound difference both between the competing views of Islam and the occident, and within occidental thought as well.

Wallerstein, emulating Marx, Popper and Darwin in the social dynamics of the occidental order, develops a system that is premised on systemic chaos and thus disequilibrium. Thereby, in the cyclo-ideological Time-Space trajectory, interaction and evolution lead to heightened levels of



complexity born out of chaotic perturbations. The social, economic and political implications of such chaotic dynamics are, therefore, an increasingly unstable institutional order, social contract and global relations. On the other hand, Buchanan's social contract theory is based on a profound sense of methodological individualism, whose aggregative preferences lead to a non-interactive implication on learning from the side of the social monolith to the formation of individual preferences. This marks the absence of causality in the polity-market interactive relations. We have also noted that the same partitioned views between the two classes of thinking have pervaded occidental thought relating to polity-market and world-system behavior.

We have thus come to the conclusion that unless a world-system and its social contractarian principles are premised on an axiomatic reference that remains invariant at the core and that by itself prevails as stable, complete and in perpetual equilibrium, no meaningful polity-market interaction or socio-scientific explanation within the praxis of unity of knowledge can be guided, formed and evolved. This is where the methodological differences in the social and institutional contractarian implications appear between the world-systems guided by the IIE-process methodology of unity of divine knowledge and the other differentiated methodologies.

The ultimate picture we derive is one of tradeoff, conflict and competition in the other systems that, altogether, are entrenched in neoclassical economic theory and its prototypes in the socio-scientific fields. Contrarily, the diversity of the IIE-processes taking stock of its premise of Oneness of the divine law, continuously refers back to the unity of knowledge as its episteme and, thereby, organizes the world-systems by guidance and instruments in this direction.

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## Part 2

# Applied perspectives



## 4 A general systems theory of knowledge

Application to family and ecology

### What is a system?

By the concept of a system we mean an organic set of extensive inter-relationships generated between agents, variables and the relations among variables of the set (Capra, 1982). The same system then interacts with other similar systems. No interaction is possible in an optimal and steady-state condition of methodological individualism or, even, in a limited case of methodological individualism.

The contrary definition of a system that remains individualized and individuated is a set of monadic states of agents, variables and their independent relations. Monads are Leibniz's infinitesimal entities that experience isolated and minuscule change. Thus came about the idea of limiting change in differential calculus from monadic calculus. This is the description of a system that pertains to neoclassical economics and the neoliberal constitutional theory of democracy and social contract, a subject discussed in Chapter 3.

### Three cases of the social system

This section is summarized from the author's paper (Choudhury, 1996). We take up three cases of the social system defined by their properties of interactions at various levels of extension, starting from the one with no interaction at all. Such a category represents the set of individuated preferences of optimal and steady-state conditions in resource allocation, as in neoclassical economic theory and in the political economy of neoliberalism (Buchanan, 1971).

#### *Case 1: The hegemonic system*

In Figure 4.1 we denote three social sub-systems,  $S_i$ ,  $i = 1, 2, 3$ , of which the total social system is  $S = \sum_{i=1}^3 S_i$ .

Furthermore, we characterize each of the sub-systems by a set of preferences,  $\geq_i$ ; a set of agents,  $N_i$ ; a set of endowments,  $R_i$ ; a consumption

set  $C_i$ ; a production set  $P_i$ ; allocation of time  $T_i$  between work ( $T_{wi}$ ) and leisure ( $T_{li}$ ). That is,  $T_i = T_{wi} + T_{li}$ .

The sub-system  $S_i$  is thus denoted by,  $S_i = S_i(C_i, P_i, R_i, T_i, N_i \geq_i)$ .

Therefore,  $S$  being the linear aggregation of the sub-systems, the component variables are also linearly aggregated to reach the corresponding aggregate at the level of the total social system. The sub-systemic preferences in such a social system remain independently aggregated. So, also, the other variables are linearly independently aggregated. In this sense, therefore, the knowledge of each of the sub-systems is independent of another's. Let  $k_i$  denote such independent knowledge within the individualized sub-systems. Then,  $\cap_i k_i = \phi$ , the null set,  $i = 1, 2, 3$ . The null set,  $\phi$ , signifies independence.

Such a system is called hegemonic because of the inherent conflict that exists between systemic variables causing the state of individuation and non-interaction, optimal and monadic states as shown in Figure 4.1. An example of such a state is the system of neoclassical optimal equilibria in which no interaction can be further generated. We also deduce that the states of optimality, equilibrium and perfect information, in their complete and long-run sense, as found in mainstream economic theory, are equivalent to one another. In any of these states, systemic non-interaction exists methodologically by cause and effect.

#### Case 2: The limiting case of hegemony leading to methodical individualism

The limiting case of Figure 4.1 is to be found in the perfect individualism characterized by each of the  $S_i$ ,  $i = 1, 2, \dots$  sub-systems now becoming

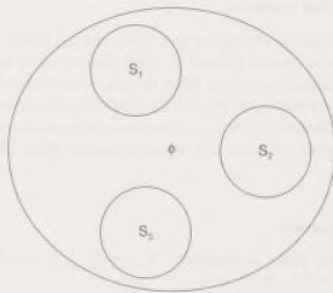


Figure 4.1 Hegemonic non-interaction

atomistic dots. Each of these dots now claims its individual optimality, equilibrium and rational states caused by self-interest. Since each of these point-wise sub-systems is in perfect information that is self-contained in states of optimality and equilibrium, it becomes a non-interacting entity. The entire social system and its total social preference are now made up of a lateral aggregation of individual sub-systems and their independently formed preferences. Such is the kind of social system that yields the constitutional order of James Buchanan and the public choice theory of democracy.

By the principle of lateral aggregation over non-interactive entities of sub-systems, we can characterize the social system and its socio-economic variables as follows:

$$S_N = \sum_i^N S_i(C_i, P_i, R_i, T_i; \geq_i) \quad (4.1)$$

$$C_N = \sum_i^N C_i; P_N = \sum_i^N P_i; R_N = \sum_i^N R_i; T_N = \sum_i^N T_i =$$

$$\sum_i^N (T_{wi} + T_{li}); \geq = \cup_i \geq_i \text{ with } \cap_i \{ \geq_i \} = \phi.$$

#### Case 3: Partial interdependence collapsing into polarity

The case of partial interdependence, say, is that of  $S_2$  and  $S_3$  interacting increasingly as their coalition progresses, but becoming isolated from  $S_1$ . Finally, in this increasing coalition between  $S_2$  and  $S_3$ , these two systems attain hegemonic independence from  $S_1$ . The limiting social preference is shown in this case as follows:

$$\lim_{\text{interaction} \rightarrow \infty} \cap_i (\cap_{i=2}^3 \{ \geq_i \}) = \phi; \cap_{i=2}^3 \{ \geq_i \} \neq \phi. \quad (4.2)$$

#### Case 4: Socio-scientific systems with extensive interaction

Figure 4.2 shows the socio-scientific system  $S$  with extensive interaction among the sub-systems  $S_i$ . We also show how the region of interaction in any round of the *Shuratic* process or the IIE-process evolves outwards, as shown by the arrows, with the growth of knowledge-flows premised on unity of knowledge and dynamically evolving therefrom.

Such kinds of interaction imply two patterns of creatively evolutionary epistemology. First, there are interactions implying unification of knowledge between the entities (agents, variables and their relations) within systems  $S_i$ . Second, these interactions are simultaneously combined with those between systems of similar interaction. Consequently, the intra-systemic knowledge-flows become increasingly dense as interaction within systems proceed. Such is the case of interaction leading to integration in the limiting case of any micro-process. Out of such micro-processes of interaction and integration come about the evolutionary inter-systemic unifying processes of similar types but in large-scale systems.

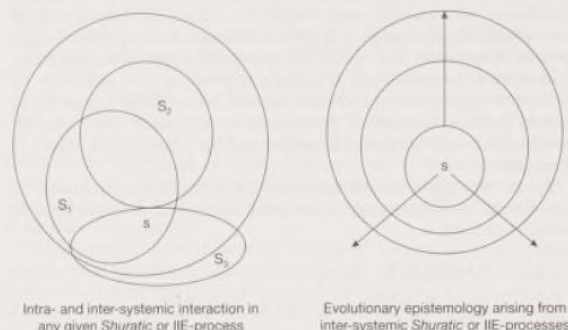


Figure 4.2 Extensive knowledge-induced interactive, integrative and evolutionary process within and across sub-systems of social systems

One notes that the kinds of evolutionary knowledge-induced interaction and systems shown in Figure 4.2 do not accept states of optimality, steady-state equilibrium and rational choices, as these have their meaning in economic theory. Only in the instantaneous case of resource allocation and institutionally discursive behavior can optimality and static equilibrium be possible. But such is a case of no interest in the world of socio-scientific reality, particularly so in the knowledge-sensitive *Shuratic* process, i.e. the circular causation nature of the IIE-process methodology.

When continuous evolution, rather than discrete phenomena is assumed, then evolutionary knowledge-based equilibria are of the continuous type as well. The particular reason for non-optimality of knowledge-flows in the global sense within temporal phenomena is the pervasive possibility of expansion and multiplicity of sub-systems that permanently interact to grow out of themselves into larger domains of reality. Continuity of the knowledge-induced evolutionary equilibria is the essence of the process comprehension of systems.

From this we derive the following set of equivalences: non-optimality and evolutionary knowledge-induced equilibria are interrelated by cause and effect with extensive interaction, and this with the process nature of systems. These characteristics can now be formalized as follows:

$$S_N = \cup_j (\cap_i S_j) [\theta_j] = \cup_j \{s(\theta_j)\} \quad (4.3)$$

where  $i$  denotes numbered systems;  $j$  denotes numbered interaction. Such numbered categories exist both in discrete and continuous spaces.

The following is a further characterization of the system and its socio-economic variables linked by interrelations:

$$\text{simulate } \{\theta(\cap_j \geq_j)\} S_i = S_i(C_i, P_i, R_i, N_i, T_i) [\theta(\cap_j \geq_j)], \quad (4.4)$$

$$\text{subject to, } C_i = C_i(S_i, P_i, R_i, N_i, T_i) [\theta(\cap_j \geq_j)] \quad (4.5)$$

$$P_i = P_i(C_i, S_i, R_i, N_i, T_i) [\theta(\cap_j \geq_j)] \quad (4.6)$$

$$R_i = R_i(C_i, P_i, S_i, N_i, T_i) [\theta(\cap_j \geq_j)] \quad (4.7)$$

$$N_i = N_i(C_i, P_i, R_i, S_i, T_i) [\theta(\cap_j \geq_j)] \quad (4.8)$$

$$T_i = T_i(C_i, P_i, R_i, N_i, S_i) [\theta(\cap_j \geq_j)] \quad (4.9)$$

$$\theta(\cap_j \geq_j) = \theta(C_i, P_i, R_i, N_i, T_i, S_i, \theta_-(\cap_j \geq_j)) \quad (4.10)$$

$$i = 1, 2, 3, \dots; j = 1, 2, 3, \dots$$

The subscript,  $-$ , denotes a process lag in the simulation of the above recursive system.

The above type of recursive simulation model can be displayed as shown in Figure 4.3. To get to Figure 4.3 we will first explain the meaning of the social wellbeing function in the context of the interactive, integrative and evolutionary systems.

Any description and movement of the world-system commences from a body of existing knowledge based on a conscious understanding of the systemic unity, given a flow of knowledge. We therefore start from the initial condition given  $\theta_0$ , which comprises the bundle of epistemological text, policies and socio-economic variables to be seriously examined in respect to attaining a level of social wellbeing through a wide spread of market-institutional IIE-process of circular causation. Corresponding to the systemic unity of knowledge denoted by  $\theta_0$  a specific *Shuratic* or IIE-process exists in the Islamic framework of complementary relations across diverse possibilities. According to the chain of relations shown earlier in expression 2.1 (or 3.1), similar kinds of new processes arise by evolution from the previous ones. This gives rise to the sequences,  $\mathbf{X}_i = \{C_i, P_i, R_i, N_i, T_i, S_i, \theta_-(\cap_j \geq_j)\}$ ; given  $\theta_j$ ;  $i$  (interaction) = 1, 2, 3, ...;  $j$  (systems) = 1, 2, 3, ... As  $\theta$  converges to  $\theta^*$ ,  $\mathbf{X}(\theta)$  converges to  $\mathbf{X}^*(\theta^*)$ ;  $S(\mathbf{X}(\theta))$  converges to  $S^*(\mathbf{X}^*(\theta^*))$ .

In the system of relations (4.4)–(4.10) the expression (4.4) defines the social wellbeing function and Figure 4.2 explains the evolution of the knowledge-induced world-system. The recursive interrelationships in the light of the circular causation model of unified reality are shown in Figure 4.3.



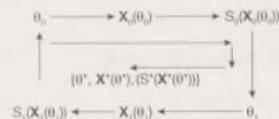


Figure 4.3 Simulation of the social wellbeing function in the circular causation model

### How does the divine law of Oneness enter the discursive simulation in IIE-process?

The circular causation model of unified reality is premised on continuous feedback between the epistemological and ontological consequences of the interrelations between knowledge-flows and their ontic (evidential) forms. This was explained in earlier chapters. In this circular flow it is neither possible, nor necessary, to prioritize specific components of the  $\mathbf{X}, \theta$ -variables. All that is of central importance is to continuously invoke the *Tawhid* episteme of unity of knowledge in every bit of action and response concerning diverse issues entering examination by means of the *Shuratic* process. Such linkages re-establish the relevance of all the variables and their relations as the circular rounds of processes continue on in the life of the Islamic socio-scientific order.

Figure 4.4 shows the continuity of the relationship between the *Tawhid* episteme and the world-system that once again re-establishes the cumulative value of knowledge-flows from all world-systems existing in complementary forms. This Final Event of manifestation of the complete, absolute and perfect knowledge of *Allah* is called the Hereafter (*Akhira*). These concepts were explained earlier in terms of the large-scale world relation, "From *Tawhid* in the primal to the World-Systems on to *Tawhid* in the *Akhira*." The continuity of this causal relationship is shown by two-way arrows commencing from the plane of *Tawhid* and returning to the same plane, which is of *Akhira*. In this process, the learning world-system, under the impact of the IIE-process methodology, remains continuously under the impact of the evolutionary systems denoted by  $s$ , taken from Figure 4.3.

The question of attainability of the stock of knowledge ( $T = A$ ) in its most unified form rests on the epistemological explanation that rules are derived in an interactive way, leading to unity by consensus or complementarities, when the system is premised on the laws and rules of the core premise of unity of divine knowledge. This fundamental epistemological premise, by itself, remains non-interactive and completely determines the world-systems as an exogenous reality. If this fundamental reality of *Tawhid* was absent, there would be no precise root from which to derive knowledge except by

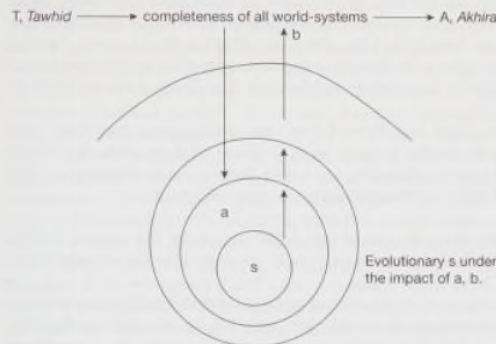


Figure 4.4 Circular causation and continuity relationships in the *Tawhidi* universe

rationalism. On the other hand, if the end is not attainable, then there remains the possibility of a random field of cumulative knowledge-flows. Such a state contradicts the completeness of the end stock as with the primal stock. Thus, the primordial and the end stocks must be exactly equal to each other. This is the idea of the mathematically complete universe in the very large scale (Maddox, 1970).

Because of the latter property of the complete universe of the stock, every sub-set of such super-cardinal topologies must attain its equilibrium point from the field of possible evolutionary equilibriums (Osborne and Rubinstein, 1994). However, because of the "open" nature of every one of the sub-sets induced by knowledge-flows there can only be evolutionary equilibriums as opposed to steady-state equilibriums (Nikaido, 1989). Case 4 of the IIE-process type world-systems becomes possible only in the extensively relational universe.

### Two examples of the *Tawhidi* social systems

#### *The Islamic family*

The patriarchal Muslim family is the institution of the highest importance in Islam. It is the institution that preceded the establishment of the mosque for governing the conduct and organization of society. The values of familial relationship with the head of the family as the bread earner and guide for the whole family, forms the building block of an elementary *Shura* of the

family. In this patriarchal construct, the ethical values of respect, social values of personal consumption, caring and consultation in all matters are discoursed and furthered. The wife of the Prophet Muhammad, Ayesha, took an active role in the Prophet's decisions regarding social issues facing the nascent Islamic community at Madinah. The *Qur'an* declares (17:23):

And your Lord has decreed that you worship none but Him. And that you be dutiful to your parents. If one of them or both of them attain old age in your life, say not to them a word of disrespect, nor shout at them but address them in terms of honor.

At the same time the role of the dutiful parents in the sight of *Allah* is warranted for obedience to the parents. In this regard the *Qur'an* states (29:8):

And We have enjoined on man to be good and dutiful to his parents; but if they strive to make you join with Me (in worship) anything (as a partner) of which you have no knowledge, then obey them not. Unto Me is your return and I shall tell you what you used to do.

In contrast to the command to be good parents in the light of the conscious belief in the Oneness of *Allah* as the pinnacle of faith, the *Qur'an* also points out the negative attitude of the rebellious child and links this to severe punishment in the Hereafter. In this regard the *Qur'an* declares (46:17):

But he who says to his parents: "Fie upon you both! Do you hold out the promise to me that I shall be raised up (again) when generations before me have passed away (without rising)?" While they (father and mother) invoke *Allah* for help (and rebuke their son): "Woe to you! Believe! Verily, the promise of *Allah* is true." But he says: "This is nothing but the tales of the ancients."

The value of charity is also inculcated in the Islamic family as a duty. In this regard the *Qur'an* says (2:215):

They ask you (O Muhammad) what they should spend. Say: Whatever you spend of good must be for parents and kindred and orphans and the poor and the wayfarers, and whatever you do of good deeds, truly, *Allah* knows it well.

Other important attributes of justice and fairness as social values arising from the basis of the family are detailed in the *Qur'an*. Among these are the Islamic law of inheritance and property rights relating to different heirs and particularly for the orphans (4:2, 3; 4:5, 6, 10), divorce (2:228-232; 4:20, 21), gender relations during child-bearing period, sanctity and dissolution of marriage contracts (2:240); women's rights to their property inherited or

bequeathed from husbands, sons, etc. (4:12), and the dower received in marriage and many other legal matters. These are detailed topics whose foundations are laid down as legal tenets in the *Qur'an* (4:11-19; 5:106-108).

In all of the above verses, we find the intimate relationship between the worship of God in strictly monotheistic belief with the kindness, duty, charity and limit of obedience to parents. The same principle of belief and conduct of life in the family is extended to all other functions of the family. The character of balance, justice, fairness and civil conduct of life that revolves around the discursive milieu of the household becomes the link between the individual and the social environment. This brings out the over-arching function of the Islamic family values in society, community and the nation at large. The family is thus seen to be a social minuscule linking self with others in the framework of the *Tawhidi* principle. Thus, the Islamic family as a discursive venue and a social minuscule governed with a patriarchal organization that links with the social environment according to the principle of *Tawhid*, becomes a topic of study by the *Shuratic* or IIE-process methodology and perspective.

#### *Contrasting the behavior of the Islamic family with the neoclassical theory of family*

In light of its extensive socialization role, the Islamic family can now be studied by the *Shuratic* process or IIE-methodology in ways that are different from the theory of the family in the economic literature. Becker (1989), for example, has given a neoclassical theory of the family that is of interest here to show its contrasts with the *Shuratic* family as a continuing example of contrast between the rationalist and unitary worldviews.

Becker explained the preferences formation in the Western family by means of an interdependent utility function, whereby preferences had to be aggregated in such a way that enabled the maximization of the interdependent utility function. The component utility functions in the aggregate utility function of the family were those of the father, mother and children. The constraints for maximization of the household utility function were household resources and allocation of time between household and other productive work. One variant of such an interdependent household utility function tried out by Becker is the head of the family's utility function, which becomes the dominant one to hold fixed while the other members' utility indexes are allowed to vary in order to maximize the total utility function, subject to the income and time allocation constraints. In such utility functions, the marginal substitution between goods and children occur by virtue of making these compete with each other with respect to the preferences on either side of seeking one or the other as productive substitutes to add to leisure or to work for earnings.

In the same light, the household utility function is used by Becker to give a neoclassical theory of marriage and divorce. Why does a couple



remain married or divorce? The answer provided is that if the incomes of the husband and wife together equal the budget on goods and services and provide a total income while remaining married that exceeds the income while being divorced, then marriage is preferred, and conversely.

In every case, an aggregate household utility function in the linear additive form in the three component utility functions is just another version of Hammond's (1987) representation of Harsanyi's (1954) fundamental utilitarianism. Consequently, all the theoretical implications of methodological individualism and competition under conditions of independently formed preferences and an exogenous conception of ethics in social choice, enter the analysis of the household utilitarian behavior. Thereby, the family as a socializing entity connects with society, markets, community and institutions at large. All these systems come to inherit a uniformly continuous and connected behavioral development. Such a broad development of individualism is referred to as methodological individualism and self-interest based on maximization objectives of self-interest. The topic was taken up in regard to Buchanan's delineation of the social contract whose roots lie in such a particular conception of man and society and the relations that ensue therefrom (Brockway, 1995).

Turning once again to the Islamic family as social system, a formalization of the Islamic behavior in the family and in the context of the *Shuratic* process would apply a form of the simulation model shown in expressions (4.4)–(4.10) to the Islamic household. The formal system is as follows: the simulation function of the *i*th Islamic family is of the form,

$$L_i(C_i, P_i, R_i, N_i, T_i, \theta_i(\geq)) = S_i(C_i, P_i, R_i, N_i, T_i, \theta_i(\geq)) + \sum_j l_{ij} X_{ij}(C_i, P_i, R_i, N_i, T_i, \theta_i(\geq)) \quad (4.11)$$

where

$L_i(C_i, P_i, R_i, N_i, T_i, \theta_i(\geq))$  is the Lagrangian function;

$l_{ij} > 0$  denote Lagrangian coefficients;

$X_{ij}(C_i, P_i, R_i, N_i, T_i, \theta_i(\geq))$  denote the different relations among  $(C_i, P_i, R_i, N_i, T_i, \theta_i(\geq))$  variables;

$(\geq) = \cap_{\theta_i} \{\geq_{\theta_i}\}$  is the interactively and consensually formed preference;

$i = 1, 2, 3, \dots$  are numbered families;

$j = 1, 2, 3, \dots$  are socializing systems with which the *i*th family interacts.

Since,

$$dL_i = \sum_j (\partial S_i / \partial X_{ij}) dX_{ij} + \sum_{\theta_i} dX_{\theta_i}$$

and

$$dX_{\theta_i} = (\partial X_{\theta_i} / \partial \theta_i) d\theta_i,$$

therefore,

$$dL_i = \sum_j (\partial S_i / \partial X_{ij}) (\partial X_{ij} / \partial \theta_i) d\theta_i + \sum_{\theta_i} (\partial X_{\theta_i} / \partial \theta_i) d\theta_i. \quad (4.12)$$

Because each of the terms on the right-hand side of (4.12) is positive with respect to  $\theta_i$ , therefore  $dL_i > 0$ . This means that the growth of knowledge-flows in the sense of social unity realized by the family ( $i, j = 1, 2, 3, \dots$ ) is the principal driving force for sustained relations between the characteristics. Any change in the  $X_{ij}$  variables *ceteris paribus* will signify hegemony of the family with respect to that variable. The intra- and inter-systemic socializing function of the family would not be sustained in the light of the social wellbeing function, which reflects the degree to which increasing systemic unity has been gained by the exercise of the law of unity that springs from the *Tawhidi* episteme. The *Tawhidi* episteme invokes an organization behavior based on the attributes of balance, purpose, certainty, wellbeing and creative evolution of the same knowledge-centered unification process in human lives.

### Human ecology

Another example of the Islamic social system is reflected in the *Allah*-man-universe interrelationship. This can be explained by the theme of human ecology. We adopt here the explanation of human ecology given by Hawley (1986) as a network of relations and feedback between human values and sustainability of the sub-systems that support life. A particular case of the ecology so defined is the environment, which is now studied in relation to the field of interaction between the moral and ethical laws, the human society and the environment as a physical entity. Such interrelations generated in feedback form with creative evolution can be studied by means of the circular causation and continuity model of unified reality. Thus, surrounding the ecological interrelations is the unifying essence from which the ecological order derives its unifying process.

The *Qur'anic* model of the *Allah*-man-universe interrelations presents profound human ecology perspectives. These span over the human self, its relations with the human and physical environment and the majestic representation of unity within the physical world of resources and potential. All of these are treated as the Signs of *Allah* in human potential to discover and understand the ever-unraveling diversity of existence.

On the topic of the structure of the reflective universe and man's position in it as a conscious observer to sustain balance by invoking *Allah*'s Oneness (*Tawhid*), the *Qur'an* declares (2:164):

Behold! In the creation of the heavens and the earth; in the alternation of the Night and the Day; in the sailing of the ships through the Ocean for the profit of mankind; in the rain which *Allah* sends down from



the skies, and the life which He gives therewith to an earth that is dead; in the beasts of all kinds that He scatters through the earth; in the change of the winds, and the clouds which they trail like their slaves between the sky and the earth; – (here) indeed are Signs for a people that are wise.

On the structure of the diverse linkages in the natural world-system that creates benefits for mankind, the *Qur'an* (16:2–21; 16:66–71; 16:114–116) points out the embedding of the Sign of fundamental unity of knowledge and life. These verses are too long to be quoted here. The central theme of the *Allah*-man-universe relation in diverse ways is conveyed.

On the abstract relationship of the human ecological nature with the Signs of *Allah* in the hidden world-systems and their search and discovery by the methods of abstraction of those devoted to the Oneness of *Allah* (*Tawhid*), the *Qur'an* (27:59–66) has given plenty of verses. Of these elaborate verses, and many more of the type throughout the *Qur'an*, we quote the following ones to bring out the *Qur'anic* meaning of the *Allah*-man-universe relationship in the scale of abstraction of the science of human ecology brought up to the level of felicitous realization for human wellbeing (27:63–66):

Or, who guides you through the depths of darkness on land and sea, and who sends the winds as heralds of glad tidings, going before His Mercy? (Can there be another) god besides *Allah*? – High is *Allah* above what they associate with Him!

Or, who originates Creation, then repeats it, and who gives you sustenance from heaven and earth? (Can there be another) god besides *Allah*? Say, "Bring forth your arguments, if you are telling the truth!"

Say: None in the heavens or on earth, except *Allah* knows what is hidden: Nor can they perceive when they shall be raised up (for judgment).

Still less can their knowledge comprehend the Hereafter: nay, they are in doubt and uncertainty thereto; nay, they are blind thereunto!

The critical attributes of the law of divine Oneness are once more invoked in the study of human ecology as conveyed by the *Qur'an*. These are balance, purpose, certainty, wellbeing and creative evolution in terms of knowledge-flows that arise from the stock of the divine unity of knowledge. Since the *Tawhidi* premise encompasses the attributes of justice and purpose, the study of human ecology is grounded on these very precepts. In this respect, the study of human ecology within the environment-economy relationship is replaced by the relational order of moral-material simultaneity. In the latter case, certain principal variables affecting the

environment-economy relationship are determined not as the primal focus but as a derived one from the premise of the definition of human ecology as a relational order of the moral-material simultaneity.

Now, prices and resource allocation follow the complementary rule between the multimarkets of life-sustaining goods in stable prices and dynamic basic-needs regimes of development. Income, wealth, distribution and productive use of the human and non-human resources are determined by the complementary condition of technology in a resource sharing and co-operative framework of co-determined possibilities. The micro-economic ethical preferences formed by interaction, integration and dynamic evolution by the *Shuratic* discursive process become the collective social preference of agents in the human ecology and embedded markets. Such preferences configure the appropriateness of goods in exchange, and the consumption, production and distribution menus. The general ethico-economic equilibrium is thus determined. Markets are knowledge-induced. In them prices, resources, wealth and income follow the knowledge-induced principle of complementarities across diversity that opens up the limits of human possibilities.

This continuous evolution of complementarities with diversity in increasing possibilities of life is the idea of the moral-material simultaneity. Micro-economic policies, principally of the type of knowledge-dissemination and guidance of markets, become the driving force of the economy-environment relationship. The great Islamic scholar, Ibn Taimiyyah, wrote on such social market guidance in his *Al-Hisbah fil Islam* (Social Guidance of Markets) (Holland, 1982) and Imam Shatibi termed the resulting benefits to individuals and society as the social wellbeing, the *Al-Maslaha wal-Istihsan*.

A very important consequence of the principle of pervasive complementarities across diversity of possibilities is the absence of opportunity cost between alternatives. Herman Daly (1992) has emphatically brought out the revolutionary context of pervasive complementarities in relation to environment studies in economics and sees this as the founding premise of a new way of understanding sustainability. The opportunity cost concept is now replaced by the relative allocation of resources between complementary opportunities that can change along the positively evolving trajectory of complementary opportunities in prices and outputs. This is the case of a continuous process of knowledge-induction in resource mobilization, prices, output via the interactive, integrative and dynamic preference formation. There can, likewise, arise degeneration of such knowledge-paths oscillating between knowledge and "de-knowledge." In case of the predominance of "de-knowledge" (that is, the end of learning) the resource allocation reverts to the neoclassical marginal substitution postulate and the principle of pervasive complementarities across diversity is lost.

In the case of intergenerational resource allocation, with the environment as a resource, the social preferences towards consumption, production and distribution are enhanced. The present responsible attitude is given

importance. The future is the natural evolution of present attitudes towards consumption, production and distribution. Hence, we revert back to the forward simulation model of resource valuation in the intergenerational sense (Choudhury and Hossein, 2002). The discounting method, which projects an assumed expected but unrealized future, is not an appropriate one for understanding the valuation problem under discursive learning at each point of the IIE-process advancement into the future.

The problem of saving for the future generation, based on an undetermined amount asked to be saved by the present generation, which Phelps (1989) points out to be an unresolved problem of saving in economic theory, is replaced by the continuous resource mobilization activity. Such continuous flow of liquidity into spending recommended by the *Shari'ah* promotes the search and discovery of new and appropriate technology. The emergence of many such technologies must be afforded by gains in productivity and growth. The increasing participation across projects, and a growing number of diverse opportunities thus opening up, result in risk, cost and product diversification. Interrelations between these factors provide the cause and effect in driving the IIE-process along the intergenerational resource mobilization path.

In the end, we once again return to the use of simulation of a family of social wellbeing functions for sustainability of human ecology. Such a criterion now assumes a vast network of interrelationships evolving under the impact of knowledge evolution. Figure 4.3 is, once again, applicable in this case.

## Conclusion

The theory of general socio-scientific systems developed in this chapter shows that, on the one hand, the underlying principles and processes in the IIE-methodology and, on the other hand, methodological individualism, give rise to two disparate worldviews. The Islamic worldview premised on the unity of divine knowledge, from which the laws and instruments are derived, to drive a unification process, presents a vastly interconnected and causally interrelated world-system. On the other hand, the aggregation principle of methodological individualism is fraught with the problem of being unable to explain how networking arises from individuation and independence in the state of methodological individualism. In this case, the rule of rationalism is made to enact a forced aggregation, which goes by the name of hegemony in political economy. We saw this to be true in the case of the theory of the family from the neoclassical economic perspective.

The systems described by the principle of unity of knowledge and those described by methodological individualism, marginalist tradeoff and competition, scarcity and independence of preferences, stand on opposite sides as truth and falsehood. Such a state of resource allocation results from the power of the Islamic world-system to explain a generalized

systems-oriented worldview in which interrelationship causes transformation by systemic unification as a process. The rationalist case, particularly shown by neoclassicism, loses this potentiality by its lateral aggregation of individual preferences and the consequential inability to explain how independent and exogenous preferences can lead to an interactive social contract. It is obvious that the mathematical measure of a relational system is greater than that of the sum of individual parts of a system.

The *Qur'an* points out the contrast between these two kinds of systems of life and thought (14:24-27):

See you not how *Allah* sets forth a parable? A goodly Word like a goodly tree, whose root is firmly fixed, and its branches (reach) to the heavens, -

It brings forth its fruit at all times, by the leave of its Lord. So *Allah* sets forth parables for men, in order that they may receive admonition.

And the parable of an Evil Word is that of an evil tree: It is torn up by the root from the surface of the earth: It has no stability.

*Allah* will establish in strength those who believe, with the Word that stands firm, in this world and in the Hereafter; but *Allah* will leave to stray those who do wrong: *Allah* does what He wills.

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## 5 The world-system according to Ibn Khaldun's *Prolegomena* comparatively viewed

The aim of this chapter is to bring out the contrasting episteme between the occidental and Islamic philosophies of history and to show how general systems of economic processes are distinctly explained in these two different worldviews. While discussing the philosophy of history in the light of economic forces we will critically examine Ibn Khaldun and Hegel's ideas of historicism and their impact on economic and social transformation as the term to explain momentous change. Transformation and "transition" are referred to here in contradistinction to the idea of invisible change that remains devoid of process. The *Qur'anic* epistemological perspective of historicism will be invoked to show why Ibn Khaldun was unable to contribute to the *Qur'anic* worldview despite his stature as a respected *Shari'ah* scholar.

### A background examination of the occidental conception of history

The study of the structure of modernity, its social dynamics determining general systems of relationships so emerging, and the abiding lessons that such interrelationships leave in history, have been given serious attention only by the highest social thinkers. The social, as opposed to the economic, forces underlying such dynamic movements have been examined in a segregated disciplinary way, as if the social, political and the economic domains are to be studied by the methods of specialization that these modern disciplines have been subjected to at the expense of a holistic approach. Thus, the subject of political economy as one of studying the dynamics of interrelationships between society, economy, institutions and the enviroining order has not been the pursuit of the economists. Only recently has such a methodological approach received some attention (see Staniland, 1985; Sztompka, 1991). Myrdal's (1968, 1977, 1989) social causation and interdisciplinary outlook on political economy was an approach to this end. Schumpeter (1961) looked at the study of such interactive dynamics in his theory of "creative destruction." The Austrian School, in general, was sensitive to the study of interactive processes in historical movements within



economic reasoning (Spechler, 1990). Marx (see Resnick and Wolff, 1987) examined it in his theory of over-determination of the social processes of dialectical evolution.

Anthony Giddens (1968) recently gave his theory of social "presencing," understood as continuous social change brought about by repetitive sequencing of circular causation between the end states of social realization. In this regard, Giddens wrote (p. 8), "In social theory time-space can be understood as 'presencing,' the continual intermingling of presence and absence that constitutes social conduct." This is an important perspective in examining how modernity comes about as an unending chain of causation between attained states and their onward evolution. Giddens' idea of modernity was projected in Foucault's writings on post-modernity. Foucault wanted to explain how post-modernity is a deconstruction of acquired states of modernity by the emergence of non-foundationalism and a plethora of non-conventional questioning of the modern mind and its scientific doctrines. Foucault referred to this totality of human understanding and the roots of knowledge as the *episteme*. Such an epistemic non-conventionalist challenge is articulated in Foucault's words (see Dreyfus and Rabinow, 1983, p. 18):

By episteme, we mean . . . the total set of relations that unite, at a given period, the discursive practices that give rise to epistemological figures, science, and possibly formalized systems . . . The episteme is not a form of knowledge (*connaissance*) or type of rationality which, crossing the boundaries of the most varied sciences, manifests the sovereign unity of a subject, a spirit, or a period: it is the totality of relations that can be discovered, for a given period, between the sciences when one analyses them at the level of discursive regularities.

In Hegel's philosophy of history (Hegel, trans. Sibree, 1956) the dialectical method of historical inquiry became another root of understanding modernity, now understood as a mutative process of destruction and recreation of social events. Hegel completed his examination of the historicist idea with the rise and convergence of all civilizations to the Germanic Civilization. Hegel's comment on the convergence of all civilizations to the Germanic World is a mark of what came to be known later on as Eurocentricism (Amin, 1989) as the hegemony of the occidental civil order including its economic mercantilism and global sovereignty (Wallerstein, 1979). Today, this Eurocentric convergence is resounded in the Hegelian philosophy underlying the work of Fukuyama (1992) with respect to his conception of democratic capitalism and the claim of Western technology as the last phase of human advancement to which the world has objectively converged according to Fukuyama. The hegemonic Idea of Eurocentricism versus other ideas on the interrelationships between economic and political power, markets and technology which, together, constitute the study of

globalization, is defended by Huntington (1993). This idea of globalization, though, is not the accepted view in other circles, most notably led by Korten (1995), Thurow (1996) and Henderson (1999).

Hegel's philosophy of history evinced this hegemonic civilizational convergence (Hegel, 1956, p. 412):

We have now arrived at the third period of the German World, and thus enter upon the period of Spirit conscious that it is free, inasmuch as it wills the True, the Eternal – that which is in and for itself Universal.

In this third period also, three divisions present themselves. First, we have to consider the Reformation in itself – the all-enlightening Sun, following on that blush of dawn which we observed at the termination of the mediaeval period; next, the unfolding of that state of things which succeeded the Reformation; and lastly, the Modern Times, dating from the end of the last century.

### **What is to be deduced for the economic structure of historical transformation from the occidental worldview?**

#### *The economic praxis of the Austrian Economic School: from Joseph A. Schumpeter to Frederick A. Hayek*

According to Schumpeter (1961) it was necessary to explain the movement of capitalism by the underlying process of constant change. It would also be along the same line of phenomenal cumulative effects of such internal changes that the order of capitalism and its supportive institution of democracy can be seen to finally sound its own parting reality, just as it has happened with socialism and communism along the passage of history.

Schumpeter's entrepreneurial capitalism is an undercurrent that brings about momentous "transition" rather than the subtle and unnoticeable "change" that is characteristic of the economic order. In the language of economic process, the entrepreneurial spirit marks an endogenous and repetitive event in the life of development planning of an economic order with much interaction, adaptation and novelty in it. Consequently, in this process of "change" the silent forces within the internal working of the market order, such as the price and resource allocation system, do not convey a dynamic sense of economic value and event. It is for such reasons that economics has not been able to give a robust theory of "transition" as opposed to "change" within the concept of *process*. Georgescu-Roegen (1971, p. 269) states, "... as far as one may search the economic literature, all dynamic models (including those concerned with *growth*) allow for the production of commodities but not for that of *processes*." Once again, we note here that in these process-oriented economic development and planning models the concept of development as cumulative change leading

to phenomenal events is the idea of "transition" rather than of benign "change." The internal adjustment of the market processes based on price and resource locomotion that causes regular but imperceptible movements, convey the meaning of benign economic change inside the core of market equilibrium.

Hayek (in Spechler, 1990) along with Schumpeter, in the new classical school within the Austrian tradition, tried to reverse the dynamic process of economic transition to the function of knowledge. Thereby, institutions, policies and planning played significant roles in Hayek's explanation of the economic process. Hayek wrote on this topic of discursive learning through sharing of information, knowledge and decision-like organizational behavior (see Spechler, 1990, p. 198):

We need decentralization because only thus can we insure that the knowledge of the particular circumstances of time and place will be promptly used. But the "man on the spot" cannot decide solely on the basis of his limited but intimate knowledge of the facts of his immediate surroundings. There still remains the problem of communicating to him such further information as he needs to fit his decisions into the whole pattern of changes of the larger economic system.

Yet Hayek (1999) believed in the role of the price system, that is, his market catalysis, to impart a self-organizing behavior to decision-making and institution. He did not believe that the market order could determine a socially just resource allocation. It could determine, simply, efficient allocation. Thus, Hayek wrote on the mirage of justice in the context of a market economy.

Hayek used his Austrian economic lineage to promote particular ideas on real money and on the endogenous nature of economic decisions, when induced by knowledge. But, like all other occidental economic theorists, Hayek did not believe the realm of economic epistemology to lie outside of human rationalist domain. In this he emulated his contemporary, Ludwig von Mises (1976, p. 16), for whom the ultimate objective of economic science was to discover a praxis for human reasoning that was not limited to particular events in history:

Theory as distinct from history is the search for constant relations between entities or, what means the same, for regularity in the succession of events. In establishing epistemology as a theory of knowledge, the philosopher implicitly assumes or asserts that there is in the intellectual effort of man something that remains unchanged, viz. the logical structure of the human mind.

Economic theory to all the Austrians was qua-historistic. History was guided by rationalism alone. The treatment of money and markets was taken

up in the light of economic rationalism. Money as quantity to the Austrians meant the use of real money in economic activities rather than the creation of money for speculative financial outlets. Hayek's *Good Money* (1999) is the money tied to currency in circulation, the value of which is shown to have a direct relationship with commodity exchange prices. When such relations between a self-organizing order of market prices are linked with the Austrian concept of the quantity of money in circulation, it can be inferred that intertemporal stability of money and commodity prices and, hence, of the value of money, can be put into effect by the good use of institutional policies and controls.

The economic process of the Austrian School was, once again, linked to steady movements in market prices which, in turn, represented the silent internal movement of the benign nature of "change" inside the economic core. This was different in concept and implication from the type of phenomenal and cumulative changes, which result in economic "transition."

Economic historicism of the Austrian School, as we see it today, is a combination of market forces and organizational behavior *à la* Herbert Simon (1987). Yet, the Austrian economic process premised its resource allocation principle on the neoclassical marginalist principle. This is proven by the fact that the role of institutions, despite their need to regulate the developmental process, remains in opposition to the market process. A marginal rate of substitution thus results between the interest of society, such as social justice, and the interest of a market economy, which is to attain efficient prices and resource allocation. In the field of static resource allocation the existence of stationary economic equilibrium is given by the neoclassical marginalist condition. Such an idea was upheld by Hayek in terms of atemporal resource allocation, though not for the intertemporal case with social relevance. Hayek wrote, "the marginal rates of substitution between any two commodities or factors must be the same in all their different uses," to establish the existence of static equilibrium in optimal resource allocation among competing alternatives. The evolutionary process over time and knowledge which, in fact, brings out the meaning of economic transition as distinct from that of economic change, was not established quantitatively by the Austrian economists, despite their pointing out the need for social relevance in economic theory and action.

### *Gunnar Myrdal and John Maynard Keynes*

Gunnar Myrdal (1968) was one of the few latter-day economists to view the economic problem within "the wider field of valuations." In this pursuit he sounded the futuristic scenario that Keynes (1963, p. 366) had foreseen:

I draw the conclusion that, assuming no important wars and no important increase in population, the economic problem may be solved,



or be at least within sight of solution, within a hundred years. This means that the economic problem is not – if we look into the future – *the permanent problem of the human race.*

Keynes went on to write on his foresight of the future understanding of economics within an environment of values and other interrelated systems of life (1963, pp. 371–372):

I see us free, therefore, to return to some of the most sure and certain principles of religion and traditional virtue – that avarice is a vice, that the exaction of usury is a misdemeanour, and the love of money is detestable, that those walk most truly in the path of virtue and sane wisdom who take least thought of the morrow. We shall once more value ends above means and prefer the good to the useful. We shall honour those who can teach us how to pluck the hour and the day virtuously and well, the delightful people who are capable of taking direct enjoyment in things, the lilies of the field who toil not, neither do they spin.

We return now to Gunnar Myrdal's worldview (1968, p. 71) which sees that "first, all conditions in a social system are causally interrelated and second, since all the more specific value premises should satisfy the first premise of rationality, they have to form a logically coherent system." In this complex of social and economic relations Myrdal saw an important role for religion in Asia and the Asian values in defining their perspectives of modernity. But to Myrdal the goal of modernization is central in focus. Religion that can guide a society to this goal was considered as the acceptable one. Hence, consistency and a rational approach to the non-economic problems were fundamental in the political economy that Myrdal was rightly proud of. He thus saw in the continuation of the utilitarian basis of neoclassical economics a futility on addressing, analyzing and premising policy prescriptions for the holistic view of economy, society, values and politics. Myrdal remarked vehemently against the methodological incapability of neoclassical economics in including the relevance of the non-economic element in its theory. Myrdal (1968, p. 278) wrote:

Even in another respect I feel aligned to the old tradition. When the writers in the classical and neoclassical line observed that their abstract theory could not permit them to draw policy conclusions, this was, as I pointed out, a recognition of the need for a much fuller knowledge of the society they were studying. Only by widening the horizon could they pretend to be political economists.

Myrdal, more than the Austrian School economists, came to emphasize the politico-economic nature of economic studies. He never dissociated

the interrelated problems of the social order from his institutional economic analysis. His social causation model gained its deepening meaning in his interdisciplinary methodology of a mixed economic system. Myrdal (1977, p. 106) wrote:

From then on more definitely I came to see that in reality there are no economic, sociological, psychological problems, but just problems and they are all mixed and composite. In research the only permissible demarcation is between relevant and irrelevant conditions. The problems are regularly also political and have moreover to be seen in historical perspectives.

From the powerfully politico-economic connotation of Myrdal's interdisciplinary contributions in the field of development planning and economics and society we come to the conclusion that he was riding the crest of major issues by this interdisciplinary approach. Myrdal was examining major transition phases that could be explained by a re-orientation in economic theory and facts. His incisive critique of utilitarianism and neoclassicism, both on grounds of their abstract methodology as well as social unrealism, made Myrdal think of economics and social investigations as processes in the study of transition caused by the interplay of many factors. The imperceptible adjustment of economic change by the neoclassical marginalist hypothesis was not part of Myrdal's profound political economy.

From a wide survey of economic thought we come to the conclusion that the topic of economic "change" and "transition" as processes in historiography is treated in two disparate ways in the literature. The two approaches have methodological problems of their own with respect to how they use these concepts to explain the economic process within a general systems approach to the understanding of socio-scientific reality. The first of these schools is the classical utilitarian basis of neoclassical economic reasoning. It is characterized by a perpetual undercurrent of imperceptible change in terms of marginal adjustment, leading to pervasive equilibrium and optimality rules of resource allocation.

Optimality and equilibrium in such a self-adjusting scientific nicety are axiomatically assumed on the basis of the first and second order conditions of marginal rates of substitution. The same model of smooth marginal substitution, optimality and steady-state equilibrium is uniformly applied both to the case of perfect, as well as imperfect, competition, to individuals and institutions, to social welfare and public choice, to incomplete markets in the micro-economic and the macro-economic case of production and growth. Thereby, the praxis of methodological neoclassicism neutralized all major disturbances from its trajectory of change. Institutions, policies, preference changes and major technological shifts do not characterize the smooth nature of the neoclassical resource allocation and market adjustment case along the



smooth production possibility curve, the production isoquant, the consumer and social indifference curve, and so on.

The phase of economic transition is reflected in the optimal and equilibrium conditions of resource allocation as the cumulative result of underlying imperceptible change. Subsequent evolution of the economic transition points is enabled by long-run technological change. But the structure of the resource allocation problem with respect to subsequent levels of equilibrium and optimality remains intact. Hence, the process underlying evolution remains undefined during the transition from the short run to the long run.

In the cases of Marx's dialectical problem and Myrdal's social causation, the same trajectories of economic evolution represent complex disequilibrium dynamics. Accordingly, there is no possibility for the trajectories to either intersect as they increasingly evolve or to be well behaved in the sense of any degree of smoothness along them. Consequently, it becomes impossible for such trajectories to be used for purposes of prediction. Such an unstable and unpredictable nature of the trajectories is more pronounced in Marxist dialectical transition than in the case of Schumpeter's "creative destruction" and Myrdal's social causation. This is due to the reliance on relative market prices of exchangeables in Schumpeter's model and efficiency conditions called forth by Myrdal's goal of modernization of the development planning processes.

### **The general picture on the rationalist roots of the occidental world-system**

All process models of the occidental genre have their links with the kind of methodological individualism, independence between species and relations as characterized by social Darwinism. Besides, all of these conditions being premised on the epistemology of Rationalism, they rest permanently on the falsification hypothesis pronounced by Popper (1972). When the conditions of rationalism and falsification prevail as the internal structure of "change" and "transition" in the economic model, geometrical co-ordinates denote points where the subsequent future generations lose their continuity with the previous parents. Thereafter, natural selection overtakes the path of organic evolution.

This uniform way of explaining all the varying concepts of economic change and transition in different models establishes the methodological problematic of economic theory as it has evolved in the West. That is, economic change marks imperceptible adjustments at every short period of time. It denotes a necessary scientific axiom for the existence of steady-state equilibrium and optimality of resource allocation using smoothly behaving economic objectives, such as utility maximization, profit maximization, etc. Economic transition is the end point of the underlying cumulative change.

Historical economic transition denotes complex phenomena tied up with particular economic problems. In the economic literature, complexity theory has offered no accepted methodology by which historical economic transition can be explainable as a substantive nature of evolution along with the process nature of economic change.

### **The place of Ibn Khaldun in the economic structure of historical evolution**

Ibn Khaldun (1332-1382) is the most celebrated social and economic historian of the Muslim civilization who bequeathed to the world of learning the original idea of a comprehensive systemic view of development, change and transition. Ibn Khaldun believed in social hierarchy underlying historical transformation. His hierarchical thought on the historiography of civilization transformation stratified his idea of layers of progressive advance of a primitive society, starting off from its early clannish solidarity, which he referred to as *Asabiyya*, to the phases that eventually mark the rise and fall of the *Ummān*, the nation state. This idea of the rise and decay of nation state also encompassed the dynamics of civilization that Ibn Khaldun had set out to propound.

Ibn Khaldun, much earlier than the school of Physiocracy and about four hundred years before Karl Marx, gave a succinct explanation as to how historiography can be studied as a vastly interrelated web of interactions between various domains of human activity. It would, then, be correct to attribute to Ibn Khaldun the early meaning of political economy in this vastly interactive sense. Like the physiocrats and Marx later on, Ibn Khaldun also premised his materialistic explanation of historical transition on epistemological foundations and wanted to establish a general theory of such historical dynamics upon the firm foundation of a law. Ibn Khaldun explained the transition from *Assabiyya* to *Ummān* in terms of hierarchy of stages. Following the rudimentary first stage of *Assabiyya* came the establishment of a state out of conquests by the hardened warriors of *Assabiyya*. The state assumes sovereign power to establish and protect itself from aggressive opposition from within and outside. A successful establishment and continuance of the state on these power-centered fronts causes the state to form an organized hub of activities around political economy (Haddad, 1989). Activities appear as the urbanization of *Assabiyya* life towards forming a city. But the birth of the city also carries with it the seeds of an eventual decay and decline of the state, as the frailty of pomp and splendor in city life enervates the martial spirit of *Assabiyya*. This brings about economic de-stabilization that makes the state function in an increasingly costly way. The citizens as individuals now come to acquire the character of meanness, cunning and competing self-seeking interest against others.

At the level of city, the state finds that economic "wants" instead of economic "needs" get predominance in demand. A growing gap in prices and, thereby, in earned incomes and revenues, appears between the producers of luxury goods ("wants") and those of necessities ("needs"). This widening income gap drives many entrepreneurs into industries that produce luxury goods. The result is a general increase in price level caused by the excess demand that now appears in all sectors of the economy. The state intervenes to tax citizens in order to finance its operations and finds the revenues in the sectors producing expensive goods, which now increasingly engage the state's attention for economic expansion. But even as the taxation increases, general spending power decreases, and the expanding economy led by specialized sectoral diversification comes to a halt. Now, even though the state earns revenues from general taxation, its expenditure is found to be in unproductive directions marked by the continued financing of luxury goods-producing sectors. The economy now gets a double constriction, first from the side of a natural evolution to the pampered *Uman* decaying from its early phase of solidarity and frugality found in *Assabiyya*. Second, the economic decadence coming out of specialization and loss of sustainability compounds with the unproductive spending policy of the state.

Ibn Khaldun discouraged the erosion of the producing and merchant community by state intervention while he explained the nature of the systemic relations that get intertwined between various political, social and economic hierarchies during the advance from *Assabiyya* to the full-fledged *Uman*. In this respect, Ibn Khaldun's *Prolegomena* (*Muqaddimah*) (Rozenthal, 1958) was, indeed, a forerunner of Adam Smith's *Wealth of Nations* four hundred years later.

The expansion of economic sectors also increases the psychological motive in the citizens to acquire expensive artifacts of life. This causes competition between individuals in acquiring the expensive "wants" with lower real incomes. The early phase of solidarity and co-operation that marks *Assabiyya* is now dissipated into economic specialization and hedonic competition rising out of the psychological transformation of individual demand for the expensive artifacts of life. Ibn Khaldun explained in detail the nature of such economic specialization and sectoral shifts during the transformation from *Assabiyya* to *Uman*. At the end, in the words of Muhsin Mahdi (1964, p. 219), who explains the texts of the *Prolegomena*:

Now that that superstructure has been destroyed, men fight again, but not for the hopes that they had once entertained. Motivated by the fear of hunger, they fight for mere existence, and like the primordial man who fought out of the same motive, they display the beast in man and return to the life of beasts.

## **Ibn Khaldun's general theory of social, political, economic and scientific historiography**

### *Ibn Khaldun's political economy*

Ibn Khaldun wanted to establish a general theory of historical dynamics on the scale of social, political, economic and scientific transformation. He showed a monotonically positive relationship between these forces and the trajectory of advance of a civilization from *Assabiyya* to *Uman*. Ibn Khaldun argues that the rise of urban culture and the passion to sustain it would be followed by the need for technological and scientific advancement. But we also read from the *Prolegomena* that the ultimate dynamics of economic expansion brings about its own decay and decline in the process of evolution of a civilization towards its urban fullness. Consequently, the scientific and technological advancement that goes along with the economic expansion must also be seen as the seed of the economic expansion and the cause of decadence of the maturing society. Science, technology and economic specialization go together in this interrelationship and, therefore, contribute to the eventual disappearance of a rising plethora of civilizations that come and disappear along the temporal phase of historical time.

Ibn Khaldun thus turned to his two other more fundamental premises to explain the dynamics of historical change as opposed to the economic and social manifestations. In the social and economic explanation, Ibn Khaldun simply gave an empirical inference not a philosophy of history. But in seeking for permanence of his theory of historiography, Ibn Khaldun was searching for an abiding praxis.

In explaining an essence of permanence of the historical dynamics of civilization change, Ibn Khaldun thought of the "science of culture" (Mahdi, 1964, p. 264). The "science of culture" meant the totality of the underlying forces that can be predicated to explain the causes of historical analysis of events as they come by. The knowledge of the science of culture in this sense could thus be made as the a priori groundwork to explain the a posteriori historical narratives. Yet, Ibn Khaldun did not place the science of culture prior in importance to the reading of historical events. Thus, in this respect, Ibn Khaldun was an empiricist like Marx and an ontological thinker like Hume to formulate the science of culture as an a posteriori premise for explaining the nature and causes of historical events in the form of permanent principles underlying narrative historical events.

But Ibn Khaldun encompasses both the art of historical analysis and the science of culture that are, together, subordinate to the art of historiography within a broader scheme of things. Such a universal order explaining the broader scheme of things was Ibn Khaldun's regime of the Islamic Law (*Shari'ah*). Indeed, Ibn Khaldun was a pragmatic *Shari'ah* scholar by virtue of his experience in political life. He had worked as an ambitious



administrator and competed for various political and administrative stations in the courts of viziers and kings. These experiences brought about vicissitudes of fortune to Ibn Khaldun between Tunisia, Spain and Egypt. In many of these political adventures Ibn Khaldun himself took an active part in the political fratricide of the time (Enan, 1993).

### *Ibn Khaldun's emphasis on the divine law, the Shari'ah*

Ibn Khaldun's intellectual and political opportunity led him to understand how the *Shari'ah* could work in delineating the process of a universal history for the good of mankind. Ibn Khaldun thus explained the comprehensive concept of wellbeing encompassing man and his environing whole. He premised the possibility of this wellbeing on the divine law that could integrate and co-ordinate as a single reality the good and felicity of this worldly pursuit with the blessing of God in the Hereafter. All of mankind's worldly activity and of the ultimate success of the believer in the Hereafter thus rested on this integrated and coherent activity that Ibn Khaldun saw to be causally co-existing by means of the inextricable relationship between the Hereafter and this world (Mahdi, 1964, pp. 232–253).

Within the regime of the *Shari'ah*, Ibn Khaldun saw the possibility for the Law of Justice, Peace and Wellbeing for mankind. Ibn Khaldun's analysis of the regime of the *Shari'ah* in relation to his holistic view of the historical phenomenon as explained in the *Prolegomena* was a general theory governing the "science of culture" as its subsidiarity. *Shari'ah* became a formal logic not confined to an Islamic state alone. The wellbeing criterion emanating from the *Shari'ah* was thus considered as the universal objective goal across all cultures and peoples.

The wellbeing objective criterion that Ibn Khaldun had in perspective was a substantive concept. It was reopened only in the last few years by a similar idea now being based on ethical deontology and moral consequentialism (Sen, 1990). Imam Shatibi and Imam Malik propounded the concept of the social wellbeing earlier in their comprehensive theory of the social contract, *Al-Maslaha wal-Ishtisak* (Shatibi, trans. Draz, undated). These substantive contributions to an interactively complementary understanding of the problems of political economy and social contract could only be possible in interactive and integrated systems that allowed for the unity of knowledge across different domains of existence as premised on the *Shari'ah* (see Choudhury, 1993).

### **Formalizing the Khaldunian dynamics of historicism**

One can now conceptualize the interrelationship between the regime of the *Shari'ah*, the "science of culture" and "historiography" in the light of Ibn Khaldun's sociological praxis. The regime of the *Shari'ah* encompasses

both the art of studying history and the science of culture. But the science of culture was a posteriori to the actual incidence of historical events. The passage from *Shari'ah* to historiography was primal. This was followed in an a posteriori sense by the closure of an interactively integrated universe by its explanation with the science of culture as a method. This passage of historical explanation completed the return passage from this world-system floating in history to the further continuance of the regime of *Shari'ah* as the primal explanatory premise of all events. We explain this process interrelationship in Figure 5.1 and by means of expression (5.1).

It would not be possible to complete the cycle shown in Figure 5.1 in any other way. A transition from the *Shari'ah* to the science of culture and then to historiography followed by a return to the regime of the *Shari'ah*, would miss out the medium through which the last transition proceeds in continuity. Thus, the historical transformation according to the regime of the *Shari'ah* in Ibn Khaldun's systemic universality of historical explanation rests upon the continuous process shown by expression (5.1) within which all the details of existence interact and integrate to attain that dynamic onward movement towards the unique premise, the laws of the Hereafter governing wellbeing on earth and causally returning to that very supreme law, the *Shari'ah*. Expression (5.1), when extended over all different detail of life *à la* the *Prolegomena*, defined Ibn Khaldun's methodology of cumulative causation.

The most pronounced contribution of Ibn Khaldun to human thought could be seen in his circular causation methodology in the light of the central position of the moral law derived from the divine sources and then carried to, and reversed from, the world-system through the process detail of existents. This epistemological delineation of Ibn Khaldun's thought transcends the otherwise usual categorization given to his contribution solely as an original explanation of the dynamics of transformation of the life of a civilization from *Asabiyya* to *Umrān*, taking account of the political, economic, social and scientific forces that interact and evolve in this world-system. The objective study of history to Ibn Khaldun was thus primarily the movement of the possibility of realizing the organization of the political economy and social contract of wellbeing that was creatively premised on and, in turn, recreated the same divine understanding of existence. Only in this way would it be possible for Ibn Khaldun to complete a historical cycle that he left out from his explanation as shown in the causality chain of expression (5.1).

### **A critique of Ibn Khaldun's historiography in reference to occidental and Islamic systems**

In spite of his profoundly holistic methodology as extended by means of Figure 5.1, Ibn Khaldun remained a Platonian and an Aristotelian thinker within the *Shari'ah* domain. He based the understanding of historiography



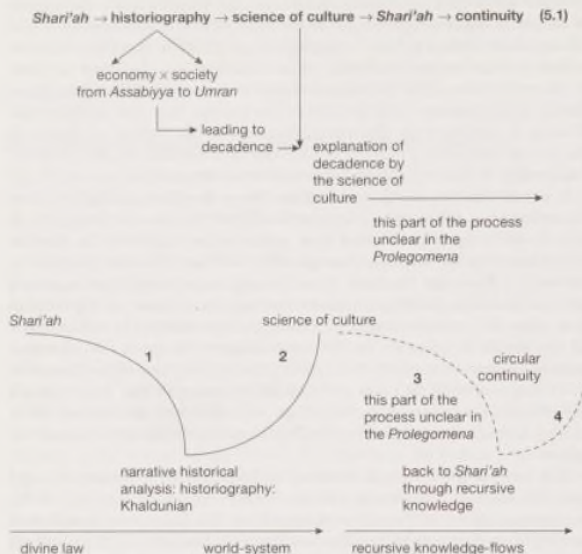


Figure 5.1 Deducing a circular characterization of Ibn Khaldun's cumulative causation methodology from the *Prolegomena*

on Reason and Rationalism primarily. Thereby, through his lineage with the epistemology of rationalism as a primal determining factor in historiography, Ibn Khaldun compares with all the occidental philosophers and economic historians of later times, several of whom we have mentioned above. Thus, the theory of economic "transition," as opposed to the benign movement of economic "change," marked Ibn Khaldun's political economy in the light of the same kind of dialectical interactive processes that characterized Marx, Hegel, Schumpeter and the Austrian School and the discursive methodology of Darwin, Popper and the social evolutionists.

The factor that tied Ibn Khaldun to this chain of latter-day thinking in political economy was the open-ended system of discursive evolution of interacting systems that Reason and Rationalism place within these systemic evolutions. Hegel, for example, argued in favor of, but could not discern the mechanism and instruments that, if institutionalized, could be

used to explain how his World-Spirit causes the convergence of civilizations to the highest good of mankind. Marx limited his dialectical explanation of historical change to the economic phenomenon alone. That is Marx's economism. Thus, the primal reduction to the source of knowledge was not extended beyond the determinism of the one-dimensional economic man and the universe (Marcuse, 1964). Like Hegel, Popper confined his explanation of the scientific universe to argumentation and refutation between non-deterministic evolutionary forces that conflict and evolve without convergence. When convergence was allowed inside such an evolutionary system, political and economic power entered by way of Eurocentric hegemony. All revolutionary and non-normal paradigm shifts in the history of occidental thought were confined within the domain of Reason and Rationalism alone.

God was numinous and had to be left outside of scientific analysis of the scheme of things. The unity and co-ordination in the sciences occurred by way of harmonizing the laws of nature according to the materialistic interpretation of history which, in Kant and Hume, became two partitioned views of an otherwise unique reality, one arising from the deductive premise of a priori reasoning and the other from the inductive premise of a posteriori reasoning. The unification of the two approaches into one consistent approach has escaped the domain of Reason and Rationalism in the occidental vision of the relationship between God, man and the universe, except by an exogenous treatment of this in the entire system of God and the laws that emanate from the sublime order. In the interactive, integrative and dynamic system of unity of knowledge, Reason is not primal but is guided at every moment by human consciousness of the God-man-universe *interrelationship*. Only in such a case does Reason become an endogenous factor of cognitive determinism that co-exists in the God-man-universe *interrelationship*. Then, alone, does Reason become part of the divine nature of man, his original God-driven essence called *Fitra*. *Fitra* so determined becomes Reason that is driven by perpetual and constant God-consciousness and awareness (Mohamed, 1996).

The problem of Khaldunian Reason and Rationalism in the cumulative causation model appears due to certain missing explanations as to how morals and values emanating from the divine law, Ibn Khaldun's regime of the *Shari'ah*, appear and act in world-systems. A methodological confusion appears when Ibn Khaldun invokes his Greek philosophical lineage in premising the *Shari'ah* on Reason. The question is this. Does divine Revelation remain prior to Reason or vice versa? If simultaneity between the two is assumed, then what is the primal premise and how does this fundamental episteme (as Foucault's totality of relations of cause and effect) drive the entire system of Reason and the God-man-universe *interrelationship*? Ibn Khaldun was silent on explaining this methodological transformation beyond recognizing the indispensable role of the *Shari'ah* in the establishment and perpetuation of the good society on earth. This

missing functional relationship between the origins of the *Shari'ah* and its enactment to attain a sustainable good society was explained by Ibn Khaldun in terms of empirical narratives of history. He then tried to trace back the analysis of the events to the *Shari'ah* by means of the method of the science of culture.

What remained absent in Ibn Khaldun's reasoning is the explanation as to how the science of culture as a methodological premise was made a positivistic basis to seek the explanation of the events in the *Shari'ah* within the larger frame of the divine law. The result was an absence of the normative roots of causation that move history, and on the basis of which, the historical events can be subsequently explained, so that a consistent cause and effect cycle of cumulative circular causation methodology is established for the study of historiography (Choudhury, 1995a). The cumulative causation methodology took roots within the circular dynamics of history and the science of culture, whereas the science of culture is not necessarily determined by the regime of the *Shari'ah*. Mahdi (1964, p. 171) explains this point of sequencing as the role of the science of culture with respect to historiography:

In the sequencing through which the mind achieves knowledge, the science of culture comes *after* history: it reflects on, and explains the external events ascertained by history. The historian cannot, however, ascertain external events without a minimal acquaintance with their nature and causes. In the art of the historian, history and the science of culture should be combined. Finally, in the order of being, the object of the science of culture comes *before* the object of history.

Reason determined the nature of the science of culture and thus assigned imprecision to this premise in historiography. Instead, the regime of the *Shari'ah* was perfect. If there exists imprecision in the functional relationship between the *Shari'ah* and the science of culture, then a substantive explanation of this would have to be forwarded to make the dynamics of a circular causation model useable in historiography. These are missing methodological aspects of Ibn Khaldun's cumulative causation model. Following an Aristotelian a posteriori logic, Ibn Khaldun concludes (Mahdi, 1964, p. 228): "Finally, the science of culture can only form judgments about, and demonstrate, what can be known by the agency of human reason."

The autonomy of Reason and Rationalism within the universe of forms and not essence causes the dissociated nature of moral existents from the God-man-universe relationship. This is true in Ibn Khaldun as in all other latter-day political economists and philosophers of history as a methodological fact, not as an assumption of the World-Spirit in Hegel, the economism in Marx, the knowledge discursive process in the Austrian School and the social causation model of interactive process explained by Myrdal.

### Extending Ibn Khaldun's historiography

Figure 5.1 in its extended form as shown, can be dissected into a Khaldunian portion and a Hegelian portion, showing in either case the discontinuity of a circularly closed process giving the knowledge formation of the universes from (1) the divine order to life; (2) from life to the actualization of knowledge. In this regard, portions of the curves in Figure 5.1 marked by 1 and 2 are Khaldunian – from the divine order (*Shari'ah*) to the world-system, whereas the portions 3 and 4 are potential. Ibn Khaldun implies both 1 and 3, and 4 but does not offer a functional methodology for these with respect to the hierarchy of systems he considered in his political economy and historiography. On the other hand, portion 2 is Hegelian – rising from the world to the World-Spirit. Portions 1, 3 and 4 are undefined in Hegel. Hence, the Hegelian world-system and historiography that combine the subjective with the objective parts of Reason, and that finds expression in the rise of the state, are totally premised on the Rationalism of segment 2.

In light of the above discussion, Figure 5.1 can be further expanded to Figure 5.2 in terms of the expression (5.2) to explain the reason-essence dichotomy in the substantive meaning of historicism. This is shown by the discontinuous curves of Figure 5.1.

### The occidental praxis of historicism in relation to Ibn Khaldun's *Prolegomena*

We have referred to the term historicism above and in earlier chapters. Historicism is a critical study of the philosophy of history (Choudhury, 2001). Lukacs (1817, p. 19) referring to Schlozer, "insisted that history

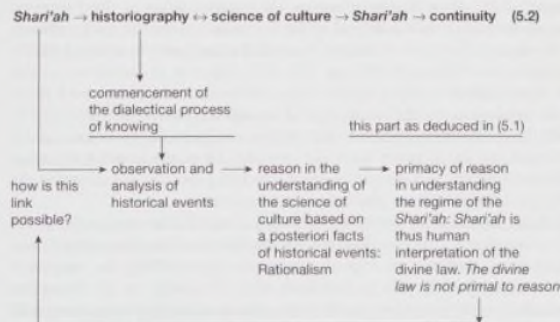


Figure 5.2 Reason-essence dichotomy in Ibn Khaldun's cumulative causation methodology from occidental to the *Qur'anic* idea of historicism



was something more than the memorization of the past, that it was 'philosophy, perpetually connecting results with causes.'" History explains the causes and occurrences of major events in the global context from a philosophical viewpoint. The emphasis here is not on historical narration but on the civilizational factors that produce such events and that establish *praxis* in our understanding of historical change.

Our arguments point out that Ibn Khaldun could not provide a methodological explanation of the reverse process of recovery of a civilization from its decadent stage to the spiritual stage. Ibn Khaldun, as an empiricist, devoted his *Prolegomena* to the study of historical narrative for Arab North Africa of his time as it went through its cycle of a primitively integrated society to a weak one caused by the problems of governance.

In recent times, attention to the study of historicism has once again surfaced with the heightened questioning on modernism and foundationalism of the sciences. Post-modernity marks a growing discontent within academia for its blind acceptance of traditional ways of scientific thinking and application. In the natural sciences this is reflected by a rejection of the foundations traditionally prescribed by scientists. In social thought it is marked by a deconstructive approach to thinking out, expressing and applying alternative paradigms of a structural nature to economy and society. In post-modern literature, the names of Foucault and Derrida are eminent ones. Here, post-modernity is expressed through stylistic expression reflecting a satire of incoherence as a mark of structuralist disorder in analytical thinking (Foucault, 1972; Wordsworth, 1990).

An example of deconstruction is found in Kurt Hubner's (1983) treatment of the "historicist" sciences. This means the study of science as confirmed through history. Yet, within this historicist school exists relativism caused by contending views among scientists. Although science in the historicist sense of its evolution is claimed to be axiomatic, whereby all extensions can be derived from a few axioms, yet a dialectical process is noted within that evolution. Hubner (1983, pp. 107-111) referring to Descartes on this topic of scientific relativism, writes: "Often the occurrence of the new is more readily analogous to the genesis of a completely differently interpreted world, the contents of which are changed so as to be partly more extensively developed and partly more narrowly viewed." Thus, the growing rejection of foundationalism and the rise of deconstructive processes are changing the landscape of science from absolutism to relativism.

Such a dialectical theory in the natural and social sciences has led to the study of non-linear processes in preference to the otherwise deterministic and reductionism methods of logical positivism representing the empirical school. Consequently, the probabilistic idea of change in the historicist approach to scientific inquiry has become a study relating to subjective probability. Indeed, dwelling on this very point, John Maynard Keynes, in his voluminous treatises on probability theory, strongly noted that the economic universe, being subjectively probabilistic, defies precise prediction.

In more recent times, historicism in economics has taken centre stage with the growing contribution of the institutionalists upon recognizing the chaotic behavior of the economic universe. "Economic fundamentals," as proposed by a foundational schema of general economic equilibrium relationships, are being rendered unattainable or costly to attain. A good example of a critique in this respect is by Heilbroner and Milberg (1995) who point out the problem of the inability of economic theory to explain social phenomena due to its entrenchment of the individual as the unit of analysis, wherein marginalism is treated as the centerpiece of neoclassical economic analysis. Consequently, many of the so-called non-economic factors of economic theory cannot be studied by the "marginalist" doctrine. The methodology of historicism appears here in relation to the need for a deconstructive and structuralist explanation of economic, institutional and social phenomena by political economy as opposed to the traditional use of economic theory.

### **The *Qur'anic* praxis of historicism**

Specifically, in order to note the distinct nature of *Qur'anic* historicism we reflect on the following verses from the *Qur'an*:

And how many populations We destroyed, which exulted in their life (of ease and plenty)! Now those habitations of theirs, after them, are deserted, — all but a (miserable) few! And We are their heirs! (28:58)

It is He Who hath made you (His) agents, inheritors of the earth: He hath raised you in ranks, some above others: that He may try you in the gifts He hath given you: for thy Lord is quick in punishment: yet He is indeed Oft-forgiving, Most Merciful. (6:165)

For them are Glad Tidings, in the life of the Present and in the Hereafter: No change can there be in the Words of God. This is indeed the supreme felicity. (10:64)

Verily never will God change the condition of a people until they change it themselves (with their own souls). (13:11)

The essence of *Qur'anic* historicism is thus embedded in the continuity of a fundamental principle of transition. That is, the determinant of historical progress or decadence is respectively premised on mankind's choice between comprehension of, and devotion to, the practice of the divine law



or departure therefrom. That this determinant marks a universal principle of *Qur'anic* historicism is understood in terms of the verse (87:18): "And this is in the Books of the earliest (Revelations) . . ."

### ***Precedence of knowledge over time in Qur'anic historicism***

We note, particularly, that because of the continuity of the divine historical principle, the *Qur'an* propounds a historicist evolution that is described not substantively by movement over time but over knowledge-flows (*Qur'an* 76:1). The *Qur'an* rejects the occidental view of time being the ultimate force of change, as found in the focus that the topic of time received in the works of Kant, Heidegger, Newton, Einstein and, presently, of Hawking (Al-Azm, 1967; Sherover, 1972; Hawking, 1988).

While Kant and Heidegger thought of transcendental time where the domain of metaphysical existence rests, yet such a time became non-functional due to the problem of heteronomy, wherein pure and practical Reason could not be synthesized. The incorporation of divine unity as a functional and primal force in the universal explanation of historical change remained absent in occidental metaphysics (Choudhury, 1997). Consequently, the concept of transcendental time was not equated with the stock of knowledge understood as the divine completion of all knowledge-flows. Transcendental time could exist simply as a mathematical entity subject to a rationalist explanation on how time could be differently viewed in psychology, philosophy, large- and small-scale universes, and the idea of time in science between Newton, Einstein and, today, Hawking.

Hawking's explanation of the time concept is tied to the structure of a space-time universe. Such a universe could be closed or open, whereby time itself has a specific relationship according to the different kinds of curvature that the space-time structure attains in the two kinds of universes. The relativistic principle of simultaneity between time and event through the medium of light in identifying a geometrical point on any particular curvature of a space-time structure is a limited reality governed by the pre-existence of a material field. If there is no physical field, there can be no event in such a non-material field according to the Relativity simultaneity principle (Einstein, 1954). The value of epistemic knowledge is lost in such a theoretical construct of physics. Such a problem, once again, dichotomizes the epistemic core in physics from that in another field of human inquiry.

The *Qur'an* (45:24) rejects the notion of primacy of time as the flow in historical explanation and replaces such time-flow by the episteme of the unity of knowledge both in the stock and flow concepts. The *Qur'anic* concept of time in relation to the primordial divine stock of knowledge is like every other universal entity, together with life and death, created by God. In its primordial form time-flow cannot determine the beginning and end of the *Qur'anic* knowledge-induced universes, for such universes

have no receptacle terminal points. In this regard, *Allah* self-references Himself in the primordial knowledge domain (92:13): "And verily unto Us (belong) the End and the Beginning."

The relation of time-flow to knowledge in *Qur'anic* historicism is created for purposes of recording and explaining phenomena that are primarily determined by their interaction with knowledge in the ontic (evidential) world. In light of this understanding of the knowledge-time relationship we are led to interpret the *Hadith al-Qudsī*, "I (God) am Time." This *Hadith* reflects the existence of a perfect relationship between the two entities in the ontic domain. It is also in light of the ontic time being a universal entity created by God (*Tachidi* knowledge = unity of divine knowledge), that we are able to interpret the *Qur'anic* verse (103:1), "By (the token of) time (flow through the ages)."

It can now be inferred that the *Qur'anic* terminology of *Dahr* refers to Time as the primordial creation of God in the frame of His *Tachidi* knowledge as Stock. On the other hand, *ʿAr* refers to the ontic flow of time as a linear function of knowledge-flows taken up in both the context of truth and falsehood (Choudhury, 1995b).

In the linear context of a knowledge-time relation in historical explanation, the importance of time in determining a historical event is consequential to the occurrence of knowledge that is induced by an event. That is, the social simultaneity of spiritual and material progress or their decadence is first determined by knowledge (or de-knowledge). Such an event is then read with a point in time-flow interpreted as a methodological medium for recording events. Despite the transcendental and temporal concepts of time, primordial time and time-flow are interrelated by the same dynamics as the relationship between the primordial stock of knowledge (*Tachidi*) and the created knowledge-flows at the ontological (the Prophet Muhammad's *Sunnah* or guidance) and ontic (evidential) levels.

### **Implicating Ibn Khaldun's dialectics and the *Qur'anic* praxis of historicism in political economy: a critique**

The path of Ibn Khaldun's socio-economic evolution from the state of *Asabiyya* to *Umran* is characterized by specialization and increasing economic competition for scarce resources. In regard to the consumption and production of "wants" as opposed to "needs" along this path of economic transformation, Ibn Khaldun's political economy gives an early form of the neoclassical tradeoff principle of resource allocation. Now, both the agents and the economic alternatives are driven by conditions of scarcity, competition and individualist self-seeking behavior among consumers, producers and government.

Ibn Khaldun, by advising the ruler and civil servants, showed how to make the best of such competing conditions. This can be thought of as a

theory of the efficient use of political power on the citizens. Enan (1993) compares Ibn Khaldun to Nicolo Machiavelli in this area of delineating the nature of power politics for use by the rulers. Later on, Max Weber propounded a similar view on the independence of ethics from politics. Mommsen (1989, p. 20) writes (edited):

it is true of both variants of political ethics (individual and political) that they maintain an insolubly tense relationship with the precepts of all religiously founded ethics, for the simple reason that force and the exercise of force represent their specific mode of action.

In all of these paradigms, the presence of intrinsically competing behavior formed out of self-interest determines the preferences of both the individual and, in the lateral aggregate sense, of the institutions and the state. Both of these entities are formulated by independent and individualistic preferences as the basis of social contracts *à la* utilitarian ethics (Quinton, 1989) and the conflict between materialism and the moral conduct in civil libertarianism (Minogue, 1963).

### More on Ibn Khaldun, Hegel and *Qur'anic* historicism

Neither Hegel's nor Ibn Khaldun's philosophies of history can explain the continued rise of the Islamic civilization throughout history, resisting all signs of its ultimate disappearance despite the political and global disorders of recent times. By the same token, some of the rising tides of new consciousness in global development, such as the ecological revolution, can be thoroughly explained as an extensively complementary process of interactive, integrative and evolutionary relations linking morals and human consciousness. Let us examine this topic briefly.

The ineptness of Hegel's conclusion on the history of Islam vis-à-vis the Germanic World can be seen in the complete negation of his own statement (Hegel, 1956, p. 360): "At present, driven back into its Asiatic and African quarters, and tolerated only in one corner of Europe through the jealousy of Christian Powers, Islam has long vanished from the stage of history at large, and has retreated into Oriental ease and repose." This conclusion gains no credence in the face of the rapid spread of Islam through the world and when its followers are becoming the second most populous sub-nation in Europe and the United States of America today (Lewis and Schnapper, 1994).

The political and economic vigor of Islam is, once more, shaping the ever-changing façade of the world order today, extending from the frontiers of the Americas and Europe to Australia (Esposito, 1994). Fresh rumblings for self-reliance in an Islamized political economy through Islamic finances, education and political conflict are today giving new meaning to the

economic and political expressions, most specifically in the Middle East, Iran, Pakistan, Algeria, Malaysia, Indonesia and Bangladesh. The recent conflicts in Palestine and Afghanistan are an eye-opener to the new wave of struggle between two camps of people who think in opposite ways. One is the camp of the Islamic grassroots that sees Islamic revivalism against the West in this conflict (Ford, 2001). The other is the camp of the West that reads a fearful opposition against its interests from the rise of the Islamic grassroots (Barber, 1992). The future of this Islamic assertion and the ensuing conflict appear to be a long drawn out one, even at this juncture of postmodernist awakening towards a new millennium. This revivalism has continued unabated even after 150 years since Hegel made his inept conclusion on Islam and the Germanic World vis-à-vis historiography.

Ibn Khaldun's methodology of historicism does not explain the continued vigor of the Muslim World despite its political bondage under different forms of autocracy in these times. Neither the Islamic expression nor the Muslim World has fallen into oblivion and changed to beastly forms of values, nations and peoples, even 620 years since the death of Ibn Khaldun. Yet there has also not come about a complete Islamic transformation into the *Shari'ah* regime for the Muslim World during this time period. The truth is that Ibn Khaldun, by focussing on historiography and not historicism as we have explained it, could not see the abiding power of an *episteme* that can shape the new world at every moment of its re-birth and continuity. This methodology of historicism was interpreted above for emerging world-systems according to the globally interactive, integrative and evolutionary worldview. This methodology is unique both to regimes of unity of knowledge and "de-knowledge" (ignorance marked by rationalism and in Arabic terminology by *Jahiliyyah*). The idea of "de-knowledge" is based on disintegrative Rationalism that limits human possibility within materialism and dialectics. The empiricist praxis of Ibn Khaldun thus could not be cogently tied to the *Qur'anic* epistemology by a precise methodology.

### The *Qur'anic* praxis of historicism as reflected in the concept of human ecology as an example

Turning finally to the *Qur'anic* unity of knowledge as the holistic worldview of historicism, we note by an example how the new vision of the interactive, integrative and evolutionary methodology for reading the events of transition and reformation are appearing today. We have taken the example of human ecology (Hawley, 1986) discussed earlier to show how the ecological consciousness, leading to a revolutionary concept of co-existence between human values and intergenerational possibilities, including the environment and peace and justice, can be sustained. Mankind's search for such universal values for human ecological sustainability, rather than viewing the environment as a capital object of sustainable development, is a comprehensive picture of mutual self-respect.



The *Qur'anic* worldview is premised on this interactive and integrative process between pervasively relational entities of unification that enables the emanating complementary possibilities to be discovered out of diversity and to evolve to higher levels of unity of knowledge. In this system of existence the reign of individualism and independence that characterizes the rationalist competing world-systems of markets, economy, society, politics, science and technology, is impossible in characterizing the individual and social preferences by moral values. By such values, material artifacts are determined which, in turn, become the determining factors of values in an endless chain of cause and effect in a pervasively relational order. The endogenous role of moral and ethical values, in concert with the subsequently determined material artifacts of life that emanate principally from enlightened preferences, are actualized through the corresponding forms of human resource and human development in which such paradigms of education and learning become focal points for conscious human transformation. The methodological framework of such a worldview of unity of knowledge in the *Qur'anic* framework can be precisely formulated, not left to rhetoric. The *episteme* of this unity of knowledge thus becomes a formal socio-scientific system (Choudhury, 1995c).

Human ecological relations, comprising a medium of unification of knowledge between diversity of human possibilities, form a trajectory in the total description of historicism, according to the *Qur'anic* methodology. Human ecology in this sense serves one particular area of human specialization in values that then links up with the remaining trajectory points in the entire nexus of historicism. Knowledge-flows in this nexus and, therefore, the historical reality of human existence, occur due to simulative movement over short-run processes that advance and accumulate to the very large-scale universe. The smallest in this scale is the relationship connecting self to the environment as the *Qur'an* mentions (51:53). The largest in this scale of the knowledge-induced universe is the passage from the primordial *episteme* of unity of knowledge to its actualization in the true Reality of the Hereafter (*Qur'an*, 69:1–3). Both of these end-points can be analytically explained as super-topological events of completeness of knowledge in the fullness of the divine order. The medium of transmission between them is the universe of knowledge-flows, where civilization and other spaces of entities learn on the same framework of unity of knowledge through the short-run simulative processes of interaction, integration and creative evolution until that appointed time of the Hereafter.

The historiographies of Hegel and Ibn Khaldun in regard to the scientific research project of human ecological sustainability remain fragmented in Figures 5.1 and 5.2 by virtue of the disconnected portions 1 and 2 and 3 and 4 in Figure 5.1. This is due to the *episteme* of Rationalism as opposed to the *episteme* of unity of knowledge, as the former remains inherent in all dissociated thinking, social action and response.

## Conclusion

Ibn Khaldun, as a Platonian and an Aristotelian philosopher of history, was an early originator of the European Enlightenment. He gave rise to a dialectical understanding of the working of the world-system. In the occidental emanation the place of God remained a metaphysical reality, and religion a metaphysical theology of rationalist conception. We find this to be the approach to the conception of God in Kant (trans. Friedrich, 1949) and Whitehead (ed. Griffin and Sherburne, 1978). Whitehead, too, incorrectly characterized the place of God in Islam while he described the rationalistic variations of the conception of God in history (p. 342):

In the great formative period of theistic philosophy, which ended with the rise of Mahometanism, after a continuance coeval with civilization, three strains of thought emerge which, amid many variations in detail, respectively fashion God in the image of an imperial ruler, God in the image of a personification of moral energy, God in the image of an ultimate philosophical principle. Hume's *Dialogues* criticize unanswerably these modes of explaining the system of the world.

Ibn Khaldun is thus a forerunner of much of the thinking on the historiography of social, economic and political dialectics that shaped Occidentalism from the times of the eighteenth-century Enlightenment to the present day. This Khaldunian lineage of the occident was intensified through Hegel and Marx and the classical economic thought of Adam Smith, all of whom wrote on various aspects of political economy. Ibn Khaldun's thought in the area of economic historiography belongs to the threshold of massive transitions of political economy. This transcends the benign motions within economic relations that, at best, explain subtle change as opposed to transition. Yet, it is the momentous transition of economic historiography that is today marking the great strides of the global order to new realizations.

Can Ibn Khaldun and Hegel explain the essential human values within the prevailing globalization process? We have argued that though the Khaldunian lineage of Occidentalism establishes divine consciousness, yet it does not offer a sound *methodology* for the understanding of the endogenously unified and complementary *interrelationships* between God, man and the universe. The same remarks hold true of Hegel's theory of the World-Spirit in his philosophy of history. The same phenomenon is prominent in the silence of the divine spirit and, with this, of a methodology for understanding and applying the *epistemology* of unity of knowledge in all of Occidentalism.

The ever-existing but newly awakened consciousness on the unity of knowledge as the final *epistemology* for all world-systems is argued to lie on the Oneness of God as a functional reality and methodology for explaining existence. Historicism and material historiography of cause and



effects between this epistemology and the realities of world-systems are shown to constitute an irrevocable methodological approach for all of human thought. Ibn Khaldun's incomplete methodology in regard to the endogenous role of the regime of the *Shar'iah*, and Hegel's in his rationalist theory of the World-Spirit, are shown to be realized in the epistemology of unity of knowledge emanating from the Oneness of God and returning to that Oneness through causal processes of interrelations between God, man and the world-systems.

This process-oriented methodology establishes the *Qur'anic* worldview of the knowledge-centered universe. Within this, the study of historicism is a specific point in the entire nexus of the knowledge-induced trajectories. For more on the *Qur'anic* philosophy of history and *Qur'anic* phenomenology see, respectively, Siddiqi (1979) and Nabi (trans. Kirkary, 1983). Such a methodology was argued to provide organic unity to the wider processes of the world-systems (Choudhury, 1999b).

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## 6 The Islamic political economy of property and property rights

### Concepts and application

#### Objective

The objective of this chapter is to delineate the differences between Islam and Occidentalism on the meaning and application of the concepts of property as a bundle of material ownership and its production, acquisition and distribution as property rights. The delineation of this theme will take us into investigating the epistemological foundations relating to property in the two systems while focussing on the Islamic worldview. The Islamic epistemology will be derived from the fundamental sources of Islamic knowledge, the *Qur'an* and the *Sunnah* (guidance of the Prophet Muhammad), and then applied to the theme of property and property rights. In this way, the social contractarian nature of property and property rights will be brought to bear upon the tenets of the Islamic Law, the *Shari'ah*. We will conclude by examining briefly how these epistemological concepts shape, or could shape, the reorganization of property and property rights in the Muslim World.

#### Background

##### *The subject of social justice in Islam*

The subject of social justice vis-à-vis the market order takes center stage in the Islamic worldview. What is the limit of rationality to which individuals are disposed in a natural way to exercise the venue of market exchange for attaining simultaneously the moral prerogative and the material benefits? To what extent should the state be empowered to intervene in correcting inequitable distribution of resources, and is the production of the nature of goods and services, whose acquisition makes up the material property bundle, an entitlement?

Underlying these questions are also the contractual arrangements between different agents and natural entities that establish the social contract. In Islam, the integrated nature of the relationship between markets and the state with respect to the pursuit of the goals and the exercise of the



Islamic law, the *Shari'ah*, is the core of the Islamic social contract. That social contract is formed by causality between market and the state vis-à-vis the issue of property within the encompassing framework of the *Shari'ah*. The derived social contract is not driven solely by individualism but, at the same time, it does not negate the sanctity of individual rights and freedoms.

This topic of the guidance of the market order in view of a socially just acquisition of ownership as property, and the emergence of property rights in its midst, was addressed by Imam Ibn Taimiyyah in his theory of social guidance of market. This social action and his book were called the *Al-Hisbah Fil-Islam* (see Ibn Taimiyya, trans. Holland, 1982), meaning the social regulation and guidance of the market order. While Ibn Taimiyyah remained strictly within the revered practices (*Sunnah*) of the Prophet Muhammad, which recommend the pursuit of the market process and in which was seen to exist benefits for all, yet *Al-Hisbah* required that market transactions were in accordance with the *Shari'ah* and it acted in ways that the *Shari'ah* transforms individual preferences to the moral good. Thus, Ibn Taimiyyah's *Al-Hisbah* abided by the *Qur'anic* and Prophetic guidance on using controls and natural persuasion toward transforming the market order into a just and socially congenial natural institution. The attributes of justice and fairness arising from such an ethicized market order become the goal of the pursuit jointly launched by the individual and polity, including the state, in concert with one another. Ibn Taimiyyah saw in the Islamic social contract of *Al-Hisbah* the emergence of an interactive, integrative and dynamic process of unity of beings, made possible by the exercise of the *Shari'ah*.

The sharp difference in the treatment of property between liberalism and Islam is thus opened up at the very onset in terms of the nature of social contracts according to civil libertarianism and the *Shari'ah*. Along with this substantive difference, the constituent *interrelationships* between polity and market are all differently configured. The differences can be read off in terms of the production, ownership and distribution of property, that is, property as a socially legitimated bundle of goods and its social relationships that describe the domain of property rights.

### Islamic political economy

The interactive study of property and property rights as relations and processes is contained in the field of Islamic political economy. Islamic political economy is an epistemological inquiry of socio-scientific phenomena in light of the pervasively interactive, integrative and creatively re-origivative worldview of reality presented in the *Qur'an*. These three precepts, namely interaction, integration as unification and creative re-origination as evolution, comprise the most general characterization of the functional domain of the Oneness of Allah (*Tawhid*) with the world-system. The social rules that so emanate and impact upon the conduct of agents

and entities of systems are, then, turned into instruments of knowledge. They are then carried forth by the application of the guidance of the Prophet Muhammad (*Sunnah*) to the knowledge acquired to diverse issues of life. From the fundamental premise of *Tawhid* in conjunction with the *Sunnah* follows the discursion of the Islamic polity on specific issues and problems as they arise, while using the knowledge and varied applications of the rules derived from *Tawhid* in conjunction with the *Sunnah*.

The combination of these premises, namely the fundamental episteme of *Tawhid* in conjunction with the *Sunnah* and their discursive understanding leading to application, establishes the Islamic Law, the *Shari'ah*. This last process, on developing the worldly knowledge out of the divine law, forms an extensively discursive experience extending beyond human institutions to the intellectual understanding of the interaction and the unification of relations between all entities. Such a complete discursive process is referred to here as the process of the *Shura* (consultation). Because of its extensively relational structure we adopt the broader *Qur'anic* meaning of *Shura* as a participatory process encompassing all of existence (*Qur'an*, 42:38, 49-53). We call this extensively participatory process gained from interaction across diversity of human possibilities, integration as unification of knowledge and creative evolution of the knowledge-flows primarily derived from the law of Oneness of Allah (*Tawhid*), the *Shuratic* process.

Abstracting from the general epistemological worldview, the field of Islamic political economy presents the integrative study of the economic and institutional issues and problems within the purview of the *Shuratic* process. Such an inquiry is carried out in light of a relational causality between the economic, social, institutional and concomitant problems within the whole Islamic social contract defined and advanced by the *Shari'ah*.

What Occidentalism did to the field of human inquiry by severing the problems of the natural law from the human law of society and economy, is now re-united in the framework of Islamic political economy. What Occidentalism dichotomized as the branches of economy and moral laws is now encompassed by the interactive, integrative and creatively dynamic general systems methodology in the framework of the *Shuratic* process. The *Shuratic* methodology is now formalized and applied to the particular domain of Islamic political economy vis-à-vis the Islamic social contract.

The topic of property and property rights in the context of Islamic political economy comprises the study of the *Shari'ah*-determination of the bundle of goods, wealth and resources that endow the nature of legitimate ownership in the first place. On the theme of property, the *Shuratic* discourse determining the law, guidance and the nature of individual and social rights and duties, establishes the production, acquisition and perpetuation of property and property rights. The characterization and social relationships of property thus present an application of the *Shuratic* process-oriented methodology. The *Shuratic* process-oriented methodology characterizes the

interactive, integrative and dynamic character of the process underlying the formation of the Islamic social contract.

### The epistemological premises in the delineation of the social contract

The premise of social contract comprises the philosophy, constitutional arrangements and the market and institutional forces that arise from the laws and preferences of human societies. The historical context and the evolution of values and institutions that establish the laws and guidance of such intellectual forces arise from certain epistemological foundations (Resnick and Wolff, 1987). When a sufficiently unique worldview is capable of explaining a totality of issues and problems, we have a socio-scientific revolution that abides (Choudhury, 1993a, 1993b). The universality and permanence of a social contractarian order is thus to be judged in accordance with the nature of the embedded epistemology. In this search, only the most universal one forms the worldview.

### The Islamic social contractarian worldview

The unresolved answer to that persistent scientific research project of unification between the *a priori* and the *a posteriori à la* Husserl's (see Hammond *et al.*, 1991) academic project on bridging the "phenomena" and the "noumena" of Kant (1949) and Hume (1988) from two opposite sides of the epistemological spectrums within Occidentalism, is found in the Islamic epistemological worldview. We have mentioned earlier that the nature of the general epistemological methodology of Islamic socio-scientific order is premised on a functional interplay between the agency and entities of all worlds in light of *Allah*-man-universe *interrelations*.

The process that engenders in the form of discourse between the recipients of the knowledge-flows, and using which the unification of world-systems is realized, comes about through the extensive meaning of the participatory process of the Islamic epistemological-ontological causation. We refer to this process, as opposed to the idea of terminal knowledge at any phase of assumed optimality of created states, as the *Shuratic* process. The discursive simulation of knowledge-flows thus impacts upon the constructed world-system, according to the pattern of unification of the causal relations between the entities with the unifying flows of knowledge that emanate from the fundamental epistemology of *Tawhid* and the ontology of the *Sunnah*. Such a searched, discovered and constructed world-system diversely interacted within, and then integrated by, the experience of knowledge-flows, determines the ontic forms. The term "ontic", coined by Sherover (1972), comprises the evidential entities (*bayyanaah*) that are constructed by the unification experience of the knowledge-flows derived from the combined epistemological-ontological roots of unity of knowledge in

*Tawhid* and the *Sunnah*. In this domain of evidence is found the extensively relational order of unification, manifesting socio-scientific becoming, experimental and phenomenological experiences of the Islamic world-systems (*Alameen*) (Khan, 1997).

### Characterizing the methodology of the Shuratic process

The *Shuratic* process, as a circular causation methodology of perpetual learning out of unity of knowledge, and of the unification of relations between diverse entities in world-systems, is characterized by its three stages that follow in continuum. These are, first, the interactive phase, which marks the stage of deriving knowledge through the study of interrelationships between diverse entities. This is a central depiction of the *Qur'anic* universe and its sub-systems (*Qur'an*, Chapter 16: *Al-Nahl*). The interactive stage is followed by the stage of unification or integration among the diversely interactive entities and their *interrelations*. This stage marks the derivation of unity out of diversity of understanding gained through discourse by using the law and guidance of *Tawhid* and the *Sunnah* with respect to the primal law of unity of knowledge. This primal law, along with the *Sunnah*, forms the epistemology and the ontology, respectively, of the knowledge-flows derived therefrom. The diversity of relations and the participatory process of learning are thus complemented. Diversity and complementarities, as two central aspects of knowledge-flows, are embedded in the construction of the world-system. We term this total principle as the principle of universal complementarities across diversity. The principle is fully established by several *Qur'anic* verses on the "paired" universe (*Qur'an* 13:3, 35:1, 36:36, 43:12, 51:49).

The end of the interaction stage leading to integration as participated consensus attained through the unification process within a system relating to given issues and investigations, is followed by the dynamic re-origination of the same kinds of knowledge-centered processes. This stage of re-origination and continuity of the knowledge-centered world-system is referred to here as the dynamic stage of creative evolution. Such a stage of re-origination in the knowledge-centered continuum of world-systems is referred to in the *Qur'an* as the *Khalq in-Jadid* (*Qur'an* 27:64, 29:20, 30:11, 50:15). The continuum of the interactive, integrative and evolutionary character of the *Shuratic* process is the general worldview conveyed by the methodology of unity of knowledge according to the *Qur'an* and the *Sunnah*. The continuum unravels the discursive process of the universal *Shura*. Through it proceeds the derivation of rules by discourse on the basis of the fundamental sources of knowledge. This is the process of deriving rules from the epistemological sources, called *Ijtihad*. The process of *Ijtihad* is followed by consensus (*Ijma*). An *Ijma* is further evolved by *Khalq in-Jadid* as creative evolution. This total process continues on until the Final Event of Perfect Knowledge in the Hereafter.



### **The social contract of property and property rights in light of the contrasting epistemological-ontological perspectives of world-systems**

It is now clear that, in all social contracts, the idea of property as acquisition and ownership of a bundle of goods and services by an individual or the collective is distinctly linked with the kinds of individual and social preferences that emerge in the market order and how such preferences then order the nature of resource allocation and production relations. The goods and services are of a wide category, spanning everything of material values, either as fungible assets, land, monies or futures.

Property right is a social contract that defines the conditions under which property is produced and legally held. As a result, the underlying social contract is a set of rules that must be socially acceptable and perpetuated over generations to make the relations of property abide in the advancing social and economic reconstruction. The politicization of property rights emerges from the interaction between property and the social and economic environment.

From such interaction comes about the meaning of the value of exchange. The understanding of property and property rights is inextricably linked with the concept of value (Acton, 1993). The concept of value, in turn, is based on the way a combination of material and moral values is assigned to property as it is also caused by property, and used to evaluate property in an intergenerational framework of valuation (Agius, 1990).

### **The occidental economic order and the formation of property**

The commencement of individual rights and privileges into property arises from preferences that first establish and are, in turn, legitimated by the civil laws that establish the tenets of social contract on property. In the occidental civil order the prime roles of Reason and Rationalism determining the character of needs, wants, justice, rights and privileges, define the competitive market order. An air of mystery prevails over how individual self-seeking preferences are finally united together to form social preferences.

Two factors can underlie this magical ordering and aggregation of individual preferences within the social construct. First, the invisible hand of market mechanism must assume that all individuals are rationally transformed into ethical beings looking for the common good of all while seeking the individual good. This perspective, though, has not survived beyond the textbook expressions of Smith's *Theory of Moral Sentiments* ([1790] 1982), not even in Smith's *Wealth of Nations* ([1776] 1976). In both of these works the individualistic self-love remains supreme (Coase, 1994). The second, though mutually exclusive, way for the formation of social

preferences, given the aggregation of individual preferences, is by exercising hegemony of power over the "irrelevant preferences" of the weak. This kind of manifestation of economic and political power is found to be the usual behavior of market and corporate capitalism enacted against the backdrop of powerful governments in the history of a power-centric order. On this perspective of historiography Knight wrote (1947, p. 65): "The theory (of liberalism) is that the individual is, in general, . . . the "best" judge of his own ends and of the procedures to be used in promoting them."

The following variables get intertwined in the causal relationship between preference formation and the generation of prosperity in a milieu of goods of higher technological vintages. First, skills (human resource), other resources (capital), equipment (technology) and markets must appear in place. This combination establishes the original "state of nature" that Nozick (1974) refers to as the inalienable rights of individuals and groups (firms) by which to produce a maximal scale of goods. Second, the desire of the individuals to own such goods and their means of production as deserts, determines the consumer preference function on the basis of the economic rationality of utility-maximizing consumers. The third condition preceding the formation of property is to establish a market order, where production menus and consumer demand preferences come together to establish exchange that serves the self-seeking goals of utility-maximizing individuals and the profit-maximizing goal of producers. The result of such an optimal scale of exchange mechanism is the assignment of value to economic transactions. Fourth, the transaction of goods and the assignment of value result in maximal income, profit and wealth. Property in the occidental civil order is thus defined as ownership of a bundle of valued artifacts as consumer and producer goods that are obtained under conditions of economic competition and are transacted between utility-maximizing and profit-maximizing economically rational agents.

Within the production menu, the primary factor that makes property possible in a productive sense is labor. In Locke's theory of property, labor is seen to work with an endowment of capital, specifically land, to render a thing of value. But the relationship between the primal factor of labor and the primal physical resource of land had nothing to do with any divine instrumentation of the laws of nature in the act of production and distribution. Nature, according to Locke, was to be subdued for the benefit of man within a civil society, according to the civil libertarian laws governing property (Locke, [1689] 1989).

The axiom of economic rationality underlying utility-maximizing and profit-maximizing objectives of agents leads to a state of equilibrium and optimality in resource allocation and to the attainment of this objective economic criterion. The economic idea of competition in market exchange is thus causally linked with the three revolving axioms, namely of economic rationality, optimal objective criterion and equilibrium resource allocation. When such a relationship is perpetuated in the economic system, the

assumed existence of the revolving causal *interrelationship* ceases to endow the agents with any further interactive power of exchange at the points of optimality and steady-state equilibrium. Economic rationality, by which is analyzed the production and distribution of resources and goods only at the assumed optimal points, ceases to explain the *process* whereby such critical points are attained (Shackle, 1972, pp. 89–90).

Now, to take the above state of affairs at the level of economic conditions that generate property at the social level we note, as in the political philosophy of civil libertarianism, that those social preferences caused by the optimal utility-maximizing conditions and the general equilibrium between consumer and producer equilibriums lead to the possibility of laterally adding up such individual preferences and menus to the social and institutional scale. This idea of lateral aggregation of individual preferences to form social and institutional preferences was given by Bentham (1789) and more recently by Harsanyi (1955). See also Hammond (1987) and Buchanan (1999). Consequently, the civil order of the occidental school repeats the initial conditions of the individual in the collective, thus making the latter no different in the decision-making context. We find, therefore, that much of the neoclassical methodology of consumer behavior has been transferred to explain the political economy of public choice (Buchanan and Tullock, 1962) and the political business cycle (Nordhaus, 1975).

Certain questions need to be investigated. What happens when the conditions of optimality and steady-state equilibrium are not assumed in certain economic analysis? In that case, the existing method of market valuation in terms of relative prices and marginal rates of substitution between competing alternatives breaks down and the economic method is disabled in all kinds of markets, including perfectly competitive, imperfectly competitive and incomplete markets.

### Property rights in the occidental order

The meaning of social justice, constitutional rules and legitimacy regarding the nature of property to be owned and sustained in a system of free enterprise that generates private property, devolves into the same quagmire of problems. Individualism and independence between agents and entities in the economic system, and the market order of the perceived mainstream economic reasoning and its institutional enactment, cause social decisions to be non-interactive, only laterally additive. Consequently, the moral supremacy of social contractarianism is dissociated from individual preferences. This social state leads to the same exogenous existence of moral values at the level of social preferences and menus. Reason and Rationalism lead to independence of the social, institutional and economic order from its functional interconnectivity with moral laws.

The exogenous role of morals in determining the social contract of property rights in Occidentalism and the resulting meanings of social justice and distributive equity as fairness, get distorted in a market order that is assumed to perform optimally under the condition of economic efficiency. There is no methodology in this system to promote social justice and distributive equity through the market venue where the accumulation of private property remains sanctimoniously undeterred by the social contract of civil libertarianism (Hayek, 1976; Phelps, 1989; Ferry and Renault, 1992). Because social preferences on sustainability and egalitarianism cannot be formed on the basis of endogenous ethical behavior induced into market exchange, therefore, capitalism and the occidental understanding of market exchange and the economy cannot provide a relational perspective of a just holding of property rights.

The history of property rights in the occidental civil libertarian order is one of continuity of the above mode of competing and disjointed relationships between morals and markets, distribution laws and optimal resource allocation, social justice and economic efficiency. This character of the occidental civil libertarian order forms a methodological problem that cannot be removed from the occidental economic, political and social paradigms without first altogether restructuring the epistemological foundations of this order of reasoning.

The economic movement within Western civilization, as explained by Quigley (1979), marked three epochs of this world-system. First, there was the feudal period, which evolved to commercial capitalism and this was institutionalized in mercantilism. Then followed the age of industrial capitalism, which was institutionalized as an instrument of expansion. This was followed, recently, by the age of monopoly capitalism, which was institutionalized as an instrument of further expansion and exploitation. Today, we should extend these phases of expansion of Western civilization to the age of capitalist globalization as a neomercantilist instrument of global ownership and control of resources (Thurow, 1996). Throughout these phases the material conditions of property rights pervade the character of independence of the liberal economic doctrines from global moral and ethical values. Only in most recent times is the International Monetary Fund looking into these human possibilities within its economic agenda (IMF, 1995).

### Property in the Islamic worldview

Bringing the Islamic epistemology within the theme of property and property rights makes property a responsible trust offered by *Allah* to mankind, as individuals and collectively, to acquire and use it under the injunctions of the *Shari'ah*. Thus, there is no concept of absolute ownership and property right in Islam. From the very outset, property as a bundle of material



effects acquires a morally social attribute. The social nature of property makes it of an extensively relational category.

To define, and then to explain, the nature of property right in Islam we invoke here the *Tauchi* epistemological methodology that was explained earlier. Property as a bundle of material artifacts is a knowledge-induced entity in the Islamic world-system. It exists in complementary relations across diverse entities. The complementary relations with the diverse nature of property interacting with other entities, such as sustainability, social justice, economic efficiency, institutions, markets, asset values and economic growth, bring together the tenets of the *Shari'ah* in relation to property.

From the works of Doi (1984), Muslehuddin (undated), Ahmad (1991) and Hassanuzzaman (undated) the central tenets of the *Shari'ah* can be derived (Choudhury, 2001). These are, first, the goal of establishing the primary security of the Islamic state in accordance with the establishment of the *Tauchi* knowledge in society, military defense and the development of institutions needed to carry out the state functions. Second, the *Shari'ah* looks after the guarantee of social security of all its citizens. Third, as a specific case of this attribute, the *Shari'ah* guarantees the rights to basic needs as goods and services to all individuals in an Islamic state. Fourth, the *Shari'ah* guarantees the protection of property and property rights of all in the Islamic state. Fifth, the *Shari'ah* looks after the wellbeing of the progeny in the Islamic state in terms of the perpetuation of Islamic values and belief, and with respect to the sustainability of the Islamic society.

In light of the *Tauchi* epistemology, the *Shari'ah*, as the product of the laws of *Tauchi* (*Sunnat Allah*), becomes the worldly law through the *Sunnah* of the Prophet Muhammad and the *Shuratic Ijtihad* (discourse to extract rules from the fundamental sources) and *Ijma* of the Islamic participatory process, as mentioned earlier. These, together, establish the following complementary conditions (Choudhury, 1999). First, there is the attribute of Oneness, which conveys the relational attribute of the knowledge-flows and their knowledge-induced forms. Second, the *Shari'ah* is determined by the attribute of social justice as balance. Third, the attribute of social balance establishes the purpose (*maqasid*) of creation, which is to perform the conscious worship of *Allah* in relation to human existence (*Qur'an*, 15:85). The fourth attribute of *Shari'ah* is certainty of spiritual and material rewards. The evaluation of the last attribute is done by means of the social wellbeing criterion of the Islamic state, within which are the variables of relational unity of the interacting and integrating systems as explained by the *Tauchi* epistemology. The same is equivalently explained by the event of the Hereafter as the manifest event of completion of knowledge that exists in its primordial form in *Tauchi* and that impacts on the world-system. The fifth attribute of the *Shari'ah* is its dynamic evolution to higher enhancement of the first four attributes by means of advancing further relations between knowledge-flows and the world-system.

This second set of attributes of the *Shari'ah* as the divine law in conjunction with the delineation of its five goals brings out the relational quality of the law. In this relational characterization of the *Shari'ah* there may not be any specific hierarchy except the primacy of the exogenous chain of *Tauchi* and the *Sunnah* (epistemology-ontology). The completeness of the *Shari'ah* as the absolute and perfect law and its transcendence to the Hereafter as the divine law makes the Hereafter equivalent to *Tauchi* in terms of the accumulated complete and perfect knowledge. Therefore, *Tauchi* and the Hereafter (*Akhira*) both denote the unique fullness of the Stock of Knowledge of divine Oneness. The total process of the Islamic world-system in light of the relational worldview of unity of knowledge is now fully described by the following chain of circular causation: "From *Tauchi* in the primal to *Akhira* in the end through the medium of the knowledge-induced world-systems (*Alameen*)."

Property is guaranteed and protected by the *Shari'ah* as ownership of personal material artifacts when it complies with the attributes of the *Shari'ah*, as explained above, and as it is sustained by the relational worldview in the *Tauchi* order. For instance, although the land allotted to the Prophet's Companion, Belal, was a charitable gift and in accordance with the *Shari'ah*, yet it was confiscated from Belal by the Islamic state of Madinah (*ba't al-mal*) when he left it fallow and in waste. In the same light, a financial interest-transaction as the medium of acquiring property (wealth) transgresses the meaning of property according to the *Shari'ah*. An acquisition of property that creates waste, as in the ecological sense, would not be permitted. The social conditions attached to the nature of property establish it as a relational social artifact in the first place.

As a specific case, the precept of a social good or the ecological "common" enters the *Shari'ah* understanding of property and property rights. This concept of the ecological "common" characterizes the nature of social good as opposed to being a public good. In this social good category we have the example of *Iqta* (land tenure), *Waqf* (charitable endowment), *Hiba* (gift) and *Hima* (protected land). What this means is that an award of *Iqta*, *Hiba* and the benefits of *Waqf* and *Hima* could become private ownership either of goods or other entitlements, such as certificates of shares of a financial *Waqf* (Sadeq, 2002), which then becomes interrelated with the rest of the property bundle in light of the principle of complementarities and diversity underlying the *Tauchi* epistemic. Besides, a property that is bequeathed to charitable *Waqf* ceases to be private property except by way of directing the purposes of the *Waqf* by the donors. But on the benefits themselves, only the recipient has the sole ownership. Consequently, taxation of the benefits of such social goods is ruled out at the time of transfer of the material benefits as property to the recipients. Likewise, there can be no agricultural tax (*kharaj*) on the produce of a *Waqf* or on the returns from a financial *Waqf*. Similar tax exemptions exist for other kinds of bequeathed property.

An important aspect of property is family inheritance arising from the Islamic law of inheritance. The *Shari'ah* injunction on this property makes it a blessed material artifact for the departed soul, the recipients and the trustees (*Qur'an*, 4:13). Because of the equality and justice that the law of inheritance establishes between recipients, no tax can be levied on the benefits of such moral benefits. Thus, taxation of property arising from inheritance is not justified at the time of bequeathal (*Qur'an*, 4:10).

On the matter of taxation on property there is no specific *Shari'ah* ruling, apart from the binding rule of *Zakat* (2.5 percent of the property value net of encumbrances, obligations and expenses), if this was not paid out by the proprietor before death during the *Zakatable* year. *Zakat* would be levied on *Iqta* property and *Hiba* but not on the benefits accruing from *Waqf* and *Hima* property.

### Property rights in the Islamic worldview

The relational characteristics of property in the *Shari'ah* perspectives place property rights in the heart of Islamic social contractarianism. Here, the production, consumption and distribution of property are, once again, governed by the specific preferences, menus and institutions that enable attainment of moral entitlement by all (Choudhury, 1994). The objective of the social contract is to simulate the social wellbeing function as the criterion for evaluating the degree of complementarities across diversity attained through property rights in the society and economy-wide sense, as the participatory phases of the *Shuratic* process continues.

The episteme of unity of knowledge and the *Shuratic* process transforms human preferences and then aggregates them into social preferences. Such preferences are not linear in form. Optimality and rationality based on full-information or bounded rationality axioms cannot exist. Simulation of knowledge-flows and their induced entities now replace the optimal and steady-state equilibriums that remain devoid of learning, by a continuum of learning points. Linearity of an optimal end-point path is replaced by the complex novelty of interaction. The marginal substitution methodology of mainstream economic theory is, consequently, replaced by the methodology of the *Shuratic* process, in which the principle of relational complementarities across diversity rules supreme in an extensively participatory political economy, as earlier defined.

Property right is grounded and perpetuated by the institutionalization of instruments according to the *Shari'ah*. These instruments simulate the social wellbeing function as defined above, within the *Tauhid* governed social contract. The exogenous nature of moral values in the market system of mainstream economics is replaced by the perpetually endogenous value system. Such an endogenous value system is formed within the market system, where interaction between knowledge-flows and their induced goods transform the preferences, menus and institutions into endogenous

entities. The *Qur'an* calls the entities of such a grand knowledge-induced transformation process the Signs of Allah (*Ayat Allah*) (*Qur'an* 41:53) in the Islamic world-system (*'Alameen*) (*Qur'an* 1:2; 21:17).

The intergenerational sustainability of property right is a specific goal of the *Shari'ah*. This calls for valuation of the property bundle in light of the Islamic social contract. The question of value and its assignment through the endogenous value system across the Islamic political economy assumes center stage. In the knowledge-centered system of Islamic political economy, value is not the congealment of labor expended in production, for the wage rate cannot claim the primordial essence of use-value that remains intrinsic in produced and primary goods. Rather, it is the existence of this primordial essence that causes the production to proceed, wages to be earned and prices to be charged on goods and services. Hence, the value of a thing is its price or wage rate net of the intrinsic value in such things. The medium to discover such intrinsic value, on which is determined the exchange value in an endogenously ethicized market exchange, is the knowledge-centered relational order of political economy, whereby the intrinsic value is integrated in the process of exchange through discourse and abeyance to the divine law, the *Shari'ah* (Choudhury, 2000, Chapter 4). We will address this question of valuation of assets in the intergenerational framework with endogenous ethics and morality embedded in ethicized market exchange, in Chapter 8.

### Brief cases of property rights in the Muslim World

The central place of property rights in Islamic Law is entrenched in the modern Constitution of Saudi Arabia (*Saudi Arabia Information Resource*, undated). This is an example of the *Shari'ah* outlook on a combination of different kinds of property and property rights according to various kinds of social capital that are in place in the form of tangibles and intangibles. The two Holy Mosques (Makkah and Madinah) are the high altars of social property entrusted for care and protection to the Saudi Government for all Muslims (Article 24 of Saudi Constitution). Legal rights and social security are rights of all residents in Saudi Arabia (Articles 27, 31, 36). Workplace rights and obligations between the employer and employee are guaranteed in the constitution (28). Education at all levels is a right guaranteed for all those who can enter these different levels of education (Articles 29, 30). Environmental rights are guaranteed (Article 32). Personal rights to financial and other property and personal confidentiality are guaranteed (Articles 38, 40; in the same text see also women rights to property). Copyright on published materials and the dissemination of published materials are subject to abidance by the *Shari'ah* approval (Article 39). In all matters of state, public access to the *Majlis as-Shura* (consultative body) is freely open to all (Article 43).



On the issue of the *Shari'ah* ruling on intellectual property rights, the principle of proper and just acquisition and common use applies. The materials under intellectual property rights must be acceptable for production and dissemination, including issues like e-commerce, when the broader issues of creating invisible e-money by speculation and promissory notes are under discussion today by the corresponding *Shura* on these matters. Likewise, virtual casinos cannot be allowed to function as sources of acquiring property.

In the case of a permissible intellectual property right, such as the publication of an acceptable book for an Islamic society, the copyright on it is held by the author as property right, whereas the price of the book as a social good is made affordable according to the product and the market mechanism. This can be accomplished by producing the book in bulk and buying the copyright from the foreign publisher or going into joint production. This practice is followed today in Pakistan by Shah Muhammad Ashraf Press, in Malaysia by major publishers, including Longman, and by the Oxford University Press in many Muslim countries. There are strict publishing controls in Saudi Arabia with respect to the content and distribution of materials. Saudi universities make textbooks available free of cost to students.

On the matter of property rights on financial instruments, all the *Shari'ah* rules of financing in conjunction with the real economy according to the *Shari'ah*-recommended outlets of spending and shareholding apply. Islamic banks that deal with clientele deposits make sure that all businesses and profits for dividend payments to shareholders are done according to the *Shari'ah* conditions in the corresponding interest-free environment. On the other hand, if an operation is based on interest financing, the amount equivalent to the interest accrued is recommended to be given away to charity other than in *Zakat*. For effective risk diversification of financial instruments it is recommended that the various types of Islamic financial instruments be combined within a diversified portfolio. The share purchases are not to be revolved around risky portfolios such as speculative financial issues. Therefore, jurists have rightly argued that the returns of cost-plus pricing (*Marabaha*) often exercised in foreign trade financing, are not to be combined with secondary financing instruments, such as unit trusts, without the prior approval of the shareholders in such options.

In all of the above specific kinds of property rights in Islam, it is central to note that the ethical, social and individual rights in accordance with the *Shari'ah* goal of protecting the sanctity of private ownership and social balance are observed. For details on these specific matters of the *Shari'ah* on property rights, see Usmanu (undated).

## Conclusion

Property and property rights are privileges with distinct etymological meanings in occidental and Islamic epistemologies. In either case, these concepts

carry profound significance rooted in the two different social contracts. In either of them property and property rights are relational concepts but driven by different kinds of preferences, markets and institutional orders.

The occidental order is based on the freedom of the rationalist agent, wherein the issues of ethics and morals remain methodologically exogenous and are enforced only by laws and institutions that cause conflict between economic efficiency and social balance of distribution.

In the Islamic world-system, ethics and morals become endogenous values embedded in the *Shari'ah* that primarily shapes the preferences, rules and guidance, institutions and markets according to the episteme of the divine unity of knowledge, *Tawhid*. Just as the occidental liberal and capitalist world-system has its inner dynamics that are perpetuated along lines of methodological individualism and separation of the market system from institutional laws and guidance as separate entities, so also the Islamic world-system has its own endogenous dynamics of polity-market interaction. The *Shari'ah* process explains this profoundly as an extensively relational form of process and realization of unity between entities in the order of reality.

The political economy of the occidental world-system cannot truly integrate the interaction of diverse systems such as economy, institutions, state and society. In the Islamic praxis of socio-scientific reality this interactive, integrative and evolutionary phenomenon of process is inherent primarily by the axiom of the Oneness of *Allah*. This episteme is made to function as a relational unity in a pervasively knowledge-induced field of unification between knowledge-flows and their induced entities and their relations.

The processes of acquiring, producing and distributing property and its accumulation into wealth are also different in light of the epistemology of rationalism, on which liberalism rests, and the epistemology of unity of knowledge in Islam. The resulting methods of valuation and the consequences of property and property rights introduce an analytical transformation in the social wellbeing function away from linearity and into complexity in the framework of Islamic political economy.

We have brought together the concepts and, briefly, the application of the *Shari'ah* tenets governing the concepts underlying property and property rights and have contrasted them with the occidental methodology on the same themes. The detail of the subject matter is a vast area shaped by virtue of its dynamic nature, which is further broadened in complexity by the rapid momentum of present-day global change.

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## 7 Micro-money

### Islamic perspective

The principal objective of this chapter is to derive a simulation model explaining the interrelationships between money, real economy, prices, economic growth and social wellbeing. We argue that such a relationship between money and the real economy cannot be explained by the existing macro-economic conception of monetary relations and, therefore, by the institutional structure of monetary policies in the macro-economic framework. Substantial changes that follow by redefining the money-real economy relations in view of market forces and institutional structure bring forth the study of specific linkages between money and resource mobilization within the market order. Here, a substantive study of micro-money appears.

Furthermore, in the Islamic framework of reference we find that the substantive nature of the model of money and real economy relationship is derived from the Islamic epistemological foundations. We have already elaborated upon this epistemological derivation to establish our money-real economy model. The evolution of the chapter will thus take us from the premise of epistemological foundations to its translation into micro-money and real economy interrelations. By this, we will show that the most appropriate monetary system that results in the case of the micro-money and real economy interrelations is the 100 percent reserve requirement monetary system backed by the gold standard (dinar).

This chapter is divided into the following sections: Section 1 gives a brief review of the literature on the gold standard from which we derive the evolution of micro-money in the history of economic thought. In Section 2 we derive our own specification of the micro-money concept after noting its context within the quantity theory of money. In Section 3 we formulate the general epistemological background in light of which our model of micro-money and its real economic relations is established. In Section 4 we explain some of the glaring methodological contrasts in the concept of micro-money between Islamic political economy and mainstream economic thought. In Section 5 we connect the micro-money concept with a 100 percent reserve monetary system backed by the gold standard (dinar). In Section 6 we point out other kinds of endogenous micro-monetary *numeraire* suggested in recent times. In Section 7 we conclude with certain policy

recommendations in favor of micro-money within the context of 100 percent reserve requirement monetary system.

### 1 A brief review of the literature: gold standard and the nature of the relationship between money and market exchange

The nature of money has evaded any settled state of its theorizing for quite some time now, ever since the demise of the gold standard at the hands of the central monetary authorities in the United Kingdom following the First World War and at about the same time in the US. Economic theorists decried these instances as adverse developments in the history of money. The most prominent among them were the Austrian School economists.

Within the economic argument of the classical type, the gold standard was thought of as any similar commodity that could be freely transacted in the market system setting its own prices without government intervention and, thereby, causing a trend in the general price level in goods and services in exchange (Block, 1999). The gold standard was thus thought to be behind the social philosophy of a free market and private ownership economy in which, most importantly, the individual made free choices without state intervention. It is pointed out that over the long-run trend in prices and real transactions determined by the gold standard, there existed a profound stability in the gold price level despite certain short-run exceptions.

On the classical understanding of the gold standard, Block (1999, p. 15 (parentheses added)) wrote: "My argument is that the gold standard is the only financial arrangement compatible with such a vision (free market and private ownership with minimum government intervention)."

On the fairly stable trend of gold value over a long time period, Hayek (1999, p. 169) observed:

Under actual world conditions, however, gold may well be the most reliable and acceptable monetary standard, a conclusion that the experiences of the last years and decades support despite superficial impressions to the contrary.

By and large, the economic argument against the demise of the gold standard was the rise of powerful state intervention and the hidden agenda of powerful bankers to gain undue financial windfalls by treating an over supply of paper money as a commodity on which interest rate can be earned. Paper money thus arose as commodity money and as an economic instrument independently of market exchange for real goods and services. The fractional reserve requirement monetary system gave support to the explosive growth of money supply. Individual preferences were thus fuelled by the lure of holding money in excess of the demand for real goods and

services. This excess spending inflated the price level or it was put into savings. In the latter case, an equivalent amount of resources was a withdrawal from real economic activity by the competing financial sector. The financial sector thus establishes a tradeoff with resource mobilization into spending in real market transactions. This opposing relationship between spending and saving is true at every point of time.

The competing dichotomy of the economy between a financial sector and a real sector causes improper measurement of value of exchangeables over time by means of interest rate as the price of money. The argument behind this impropriety of interest rate can be deduced from the analysis of intertemporal resource allocation given by Hayek (1999, pp. 193–226). Hayek's explanation runs as follows. In neoclassical economic theory the intertemporal value of exchange is measured either by the ratio of the prices of goods and services under exchange or by the ratio of the marginal utility of such money-good exchangeables. But, over time, such goods, and therefore prices, experience interaction. It then becomes difficult to know the exact price ratio and, hence, determine the dynamic equilibrium conditions of exchange. In the intertemporal context, prices are affected by the supply of money that enters the economy by the formation and liquidation of savings over time. Thus, the price relatives occur according to the following ratio (interest rate: price of good 1: price of good 2: ... etc.). Consequently, there is no way of isolating the intertemporal prices from the influence of interest rate, as the price of money fuels its effect on the prices of goods and services.

Such a problem was also noted by von Bohm-Bawerk (1890), who found it impossible to isolate the interest factor from the pure exchange components in the levels of production profit. In all of neoclassical economics and Austrian economics, the theory of interest and intertemporal price effects of interest assumes a roundaboutness of production in turning one good into another good by resource allocation according to their relative prices and saving as means of capital accumulation over time. Such a price relative is taken as the measure of value. Over time, one of the prices is the rate of interest in the price ratios that evolve. Yet, such a valuation remains indeterminate because it cannot be measured exactly intertemporally.

The Austrian analysis of money and prices, seen in terms of ratios of intertemporal prices and interest rates, is a micro-economic analysis that can be subsumed within the macro-economic picture of the quantity theory of money and prices and the "real bills hypothesis." Green (1989, pp. 310–313) points out that "real bills" are exact claims on money demand in view of transactions relating to the real goods and services. Thereby, any excess supply of money is returned back to the monetary issuer in the long run. The issuance of the appropriate quantity of "real bills" assumes that non-bank preferences are fully determinate. In this kind of equality of the real bills, currency money exists in tune with the demand for money in the equation of exchange according to the quantity theory

of money. We then have the equation of exchange in the form (Friedman, 1989, pp. 1–40):

$$M_1 V_1 + M_2 V_2 = PT = P_y \quad (7.1)$$

where

$M_i$  is the money in circulation in the  $i$ th goods basket;

$V_i$  is the velocity of money in circulation;

$P$  is the general price level of goods and services transacted in the economy;

$T$  is the number of transactions performed by the circulation of the quantity of money,  $M_1 + M_2$ ;

$y$  is per capita national income;

$i = 1, 2$  goods or markets.

The identity (7.1) can be generalized to any number of specific transactions, including the market for securities. The resulting quantity of money expressed as the demand for money,  $M_i^D$ , then is,

$$M_i^D = PD(y, w, i_1, i_2, u) \quad (7.2)$$

where

$w$  denotes the capitalized wealth;

$i_1$  denotes interest rate on money assets;

$i_2$  denotes interest rate on securities;

$i_1$  and  $i_2$  can, furthermore, be considered as term structures of interest rates over different kinds of assets over time;

$u$  denotes all other variables, most importantly non-bank preferences, as in the "real bills" hypothesis.

## 2 Definition and analytics concerning micro-money

A generalization of expressions (7.1) and (7.2) in view of the intertemporal nature of asset valuation with money prices and the influence of interest rates on price ratios, as in the Austrian School with its neoclassical perspectives, now brings us to the definition of micro-money. Micro-money is the money in circulation specific to particular goods, services, assets, also clientele and, thus, multimarkets. Now, to understand the meaning of micro-money we must turn first to the specific markets for real transactions and to the preferences of the non-banking agents to determine the quantity of money that needs to be in circulation to finance such real transactions.

Our definition of micro-money requires a broader deconstruction of the expressions (7.1) and (7.2) of the quantity theory. The new identity would involve a number of critical structural changes with regards to institution-market interaction relating to central bank-commercial bank-clientele



(market) interrelationships in the context of a further extension of the above-mentioned gold standard system to the case of the 100 percent reserve requirement monetary system. This interrelationship is explained later. To address such issues we will formulate a comprehensive model of micro-money in relation to real economic transactions in the 100 percent reserve requirement monetary system with the gold standard (dinar).

Some initial problems are to be noted in the quantity theory identities (7.1) and (7.2) with regard to the concept of micro-money. A strict definition of micro-money with respect to the market transactions that micro-money serves within an arrangement of optimal private ownership and independent choices by agents must specify these in the same equations of exchange. This specification appears as follows:

$$\sum_i M_i V_i = \sum_i P_i Y_i \quad (7.3)$$

where

$P_i$  denotes price in the  $i$ th market;  
 $Y_i$  denotes per capita income in the  $i$ th market;  
 $i = 1, 2, \dots, n$ .

An expression such as (7.3) has not appeared in the equation of exchange, particularly due to the inability in defining the right-hand side in terms of a total quantity of money in circulation. However, by allowing for a large number of multimarkets with borrowing in the Walrasian sense of the entire economy viewed as the sum total of such equilibrium multimarkets, an equilibrium in the micro-monetary sector will cause a simultaneous equilibrium in the corresponding real goods market (Henderson and Quandt, 1971). Expression (7.3) now devolves into:

$$M_i V_i = P_i Y_i, \text{ for each } i = 1, 2, \dots, n. \quad (7.4)$$

We re-write (7.4) as:

$$M_i V_i / P_i Y_i = M_j V_j / P_j Y_j.$$

That is,

$$M_i V_i / M_j V_j = P_j Y_j / P_i Y_i = (P_j / P_i)(Y_j / Y_i). \quad (7.5)$$

Expressions (7.4) and (7.5) convey the meaning that, for the total volume of micro-money in financing the nominal value of transactions in the  $i$ th market, relative prices in money terms between the markets must remain stable and the markets must be in equilibrium. This result would assume a good determination of the agent-specific preferences as in the case of the "real bills" hypothesis. But the same result on the existence of

predetermined stable and equilibrium relative prices negates the complex nature of intertemporal price and quantity relations, as explained by Hayek's analysis of intertemporal resource allocation. Consequently, the above kind of deconstruction of the exchange equation of quantity theory of money does not contribute to any fresh understanding of interaction in multimarkets with the presence of money prices affecting exchange prices in terms of the influence of micro-monies in those markets.

The underlying debility of the quantity theory with respect to micro-money goes deeper. Despite the limited micro-economic disaggregation of the quantity of money on the right-hand side of expression (7.1), the appearance of the macro-economic aggregate national income in nominal terms on the right-hand side implies that monetary policies are still controlled by the central bank and the fractional reserve requirement relations exist between the central bank, the commercial banks and markets. Monetary policies have weak, or no, positive effect on micro-money. This was the complaint of the economists who favored the gold standard against the state idea of money that led to the abandonment of the gold standard. In this regard, the guru of the gold standard monetary system, Ludwig von Mises (reprinted 1981, pp. 480-481) wrote against the political causes that were behind the abandonment of the gold standard:

Sound money still means today what it meant in the nineteenth century: the gold standard.

The emergence of the gold standard consists in the fact that it makes the determination of the monetary unit's purchasing power independent of the measures of governments. It wrests from the hands of the "economic tsars" their most redoubtable instrument. It makes it impossible for them to inflate. This is why the gold standard is furiously attacked by all those who expect that they will be benefited by bounties from the seemingly inexhaustible government purse.

Walter Block (1999, p. 16) has pointed out the anomaly between Friedman's quantity theory and his hidden opposition to the gold standard. Friedman (1960, p. 40) is cited (with author's emphasis within brackets):

The fundamental defect of a commodity standard [read gold standard] from the point of view of society as a whole is that it requires the use of real resources to add to the stock of money. . . . If people will accept as money pieces of paper on which is printed "I promise to pay - units of the commodity standard," these pieces of paper can perform the same function as the physical pieces of gold or silver, and they require very much less in resources to produce.

From the above discussion we note that in the quantity theory of money, both the analytical as well as the institutional contexts of micro-money fall

short of their proper definition with respect to real economic transactions. The analytical perspective shows a serious problem of aggregation in the micro-money model of the quantity theory. The institutional perspective points out the need for a new arrangement between the central bank, the commercial banks and markets within a gold standard and with the full force of market exchange determining the micro-money and real economic interrelationships. We now turn to these issues.

### **3 An epistemological model of micro-money and real economic transactions in Islamic perspective**

The institutional and analytical problems of micro-money in the quantity theory of money lead us to investigate whether these problems can be addressed by received mainstream economics or if another methodology is required. The quantity theory, as formulated being an identity, cannot answer the following question: Does money affect price level or does the price level affect money stock in circulation through the output effect (Laidler, 1989)?

To answer the above question we note that in the gold-standard system that was conceived by the Austrians, the creation of money presupposes a well functioning economic order based on consumption and production and higher transformation processes of these activities. The question then is whether there is a circular relation between economic activity and the quantity of money? Heilbroner looked into this problem by invoking Marx's circular causation model that explains the capitalist economic order as the medium of commoditizing money. Heilbroner (1985) thereby explained his M-C-M model: money stock (M) leading to its commoditized value (C), which happens through the rate of interest as the price of money and C, thus leading to more money stock.

Keynes, on the other hand, considered the complete independence of money and monetary policy in his general equilibrium model. According to this model, money and the price of money as interest are both seen to be exogenous economic factors set independently by the money market and controlled by the monetary authority.

In neoclassical economic theory there exists no causality between money and real exchange. The two variables appear as competing assets governed by the marginal substitution hypothesis between money and real assets, each being endowed by its own price.

Monetarism (Cagan, 1989; Yaeger, 1997) holds that aggregate spending is predominantly determined by the quantity of money, although the quantity theory version of monetarism also examines feedback from the side of economic activity to money supply. Monetarism takes a policy-oriented approach toward stabilization of price level and output by controlling the money supply. The monetarists thus debate the Keynesian argument stating

that aggregate demand is more significantly affected by gross national expenditure than by the holding of money.

Between all these contending approaches, we find that money is either an exogenous asset created by the central banking authority to establish price and output stabilization or, when there exists endogenous feedback between money and economic activities, the exact nature of the price-money causality is not determined. Furthermore, in all such feedback models there exists the permanent prospect for inflationary pressure, as spending can cause upward pressure on output and prices. Such a model of indeterminacy between the quantity of money and price level through the output effect is referred to as monetary disequilibrium caused by a host of environmental factors that are, always and everywhere, governed by the monetary phenomenon according to monetarism. In the end, the question of stable price and output effects in relation to the feedback between money and real economic transactions remains unanswered.

A return to the gold standard with micro-money in a 100 percent reserve requirement monetary system must analytically answer and realize this very missing phenomenon of the money-real economy linkages in the quantity theory of money and prices. Our critical project is now explained by the building blocks of an alternative methodology and its institution-economy consequences.

### ***The Tawhidi epistemological worldview of unity of knowledge in world-systems***

Our epistemological premise commences from the following argument. Unity of systemic knowledge as a relational worldview can be realized by means of extensive interaction, linkages, complementarities and their dynamic sustainability according to certain precise economic instruments and preferences (behavior). These are all formed within a political economy that recognizes unity of knowledge as its epistemological premise. Departing from this critical foundational assumption of unity of knowledge and its attributes in terms of specific instruments, behavior and methodology will leave any system of money-real economy relations to evolve by the force of uncontrolled anomie. This will cause the money-real economy feedback to be indeterminate.

In this chapter, instead of divulging the details of the process model of interaction, integration and creative evolution (IIE-process) premised on the unity of divine knowledge that has been developed in Chapters 1 and 2 and in details elsewhere (Choudhury, 1995), we will briefly delineate and use it for formulating our micro-money-real economy model.

We refer once again to the IIE-process model in the following form. All variables are well known by now:



$$\begin{aligned} \Omega \rightarrow_F \{\Phi\} \rightarrow_{F^*} \{\Phi^*\} \rightarrow_{\Omega_1} \{\theta_1\} \rightarrow_{\Omega_2} \{X(\{\theta_1\})\} \rightarrow_{\downarrow} \rightarrow_{\Omega_3} \text{New } \{\theta_1\} \\ W(\theta_1, X(\theta_1)) \\ \rightarrow \text{continuity in repeated processes} \rightarrow \dots \Omega = H \end{aligned} \quad (7.6)$$

Primal stock of knowledge  $\rightarrow$  Derivation of primal knowledge-flows  
 $\rightarrow$  Process of deriving knowledge-flows by  $\rightarrow$  Post-evaluation  
 $\rightarrow$  Evolution  $\rightarrow \dots$  Continuity of similar processes discursion  
 $\rightarrow$  Closure in the very large-scale universe.

Now to specify, we consider two similar strings of relations shown by (7.6), one for money and the other for real economic activities. This means that, in the epistemological sense, money is a creation of *Allah* for its purposeful use in attaining wellbeing of individuals and society. Likewise, the economic order is patterned for the same purpose according to ethical values that are to be found in the Islamic Law, the *Shari'ah*. These two together, namely money and real economy relationships, along with institutional guidance as complementary pairs, follow from the *Qur'anic* principle of the "paired universe" in the good things of life.

The interrelationship between money and ethical values is pointed out in the *Qur'an* (18:19). The *Qur'an* encourages trade as opposed to interest-based transactions (*Qur'an* 2:275). The intrinsic nature of stability within world-systems between its diverse possibilities is explained by the substantive meaning of justice (*Adl*), compassion (*Ihsan*) and balance (*Mizan*). All these are unraveled by the exercise of collective action in concert with human presence in world-systems. Such a co-planar interactive discourse, leading to consensus and further evolution of the same, is the broadest meaning of the embryonic *Shura* in the scheme of things. Hence, we have the derived term *Shuratic* process from the chapter entitled *Shura* in the *Qur'an*. Systemic interaction (diversity) followed by complementary relations (consensus by the principle of paired universe) and the further evolution of such a process by the depiction of the *Qur'anic* creative order (*khalq in-jadid*) equivalently characterize this IIE-process or the *Shuratic* process.

The IIE-processes within and between the money-real economy relations are represented in expression (7.7). Below, the symbol  $\parallel$  denotes lateral and vertical interaction between the corresponding categories in the two inter-systemic IIE-processes as shown.

#### Money

$$\begin{aligned} F_1: \Omega \rightarrow_F \{\Phi\} \rightarrow_{F^*} \{\Phi^*\} \rightarrow_{\Omega_1} \{\theta_1\} \rightarrow_{\Omega_2} \{X_1(\{\theta_1\})\} \rightarrow_{\downarrow} \rightarrow_{\Omega_3} \\ W(\theta_1, X_1(\theta_1)) \\ \text{New}\{\theta_1\} \rightarrow \text{continuity in repeated processes} \rightarrow \Omega = H. \end{aligned} \quad (7.7)$$

#### Real economy

$$\begin{aligned} F_2: \Omega \rightarrow_F \{\Phi\} \rightarrow_{F^*} \{\Phi^*\} \rightarrow_{\Omega_1} \{\theta_1\} \rightarrow_{\Omega_2} \{X_2(\{\theta_1\})\} \rightarrow_{\downarrow} \rightarrow_{\Omega_3} \\ W(\theta_2, X_2(\theta_2)) \\ \text{New}\{\theta_2\} \rightarrow \text{continuity in repeated processes} \rightarrow \Omega = H. \end{aligned} \quad (7.8)$$

We obtain the following IIE-*interrelationships*, which are uniquely governed by the fundamental epistemology of *Tawhid*,  $\Omega$ :

$$\begin{array}{ccccccc} \rightarrow \{\theta_1\} \rightarrow_{\Omega_1} \{X_1(\{\theta_1\})\} \rightarrow_{\downarrow} \rightarrow_{\Omega_3} \text{New}\{\theta_1\} \rightarrow \text{continuity} \rightarrow \text{MONEY} \\ \uparrow & & & & & & \downarrow \\ \Omega: & \parallel & \parallel & \parallel & \parallel & \parallel & \Omega = H \\ \downarrow & & & & & & \uparrow \\ \rightarrow \{\theta_2\} \rightarrow_{\Omega_2} \{X_2(\{\theta_2\})\} \rightarrow_{\downarrow} \rightarrow_{\Omega_3} \text{New}\{\theta_2\} \rightarrow \text{continuity} \rightarrow \text{REAL} \\ & & & & & & \text{ECONOMY} \\ & & & & & & W(\theta_2, X_2(\theta_2)) \end{array} \quad (7.9)$$

By the elementary complex disaggregation of relations in expression (7.9) we note that:

$$\begin{aligned} \{\theta_1\} \rightarrow_{\Omega_1} \{X_1(\{\theta_1\})\} \rightarrow_{\Omega_3} \text{New}\{\theta_1\} \text{ MONEY} \\ \parallel X \parallel X \parallel X \parallel X \parallel \\ \{\theta_2\} \rightarrow_{\Omega_2} \{X_2(\{\theta_2\})\} \rightarrow_{\Omega_3} \text{New}\{\theta_2\} \text{ REAL ECONOMY}. \end{aligned} \quad (7.10)$$

Here,  $X$  denotes *crosswise* inter-systemic interaction. Such an interaction is extensive in nature. This can be worked out even from this simple disaggregation when extended to second and higher numbers of processes (not shown). The functional mappings existing between extensive interactions, as shown, generate compound functions (Choudhury, 2000a).

The wellbeing criterion function resulting from pervasive interaction across the interactive, integrative and evolutionary branches of (7.10) is represented by non-linear and complex aggregation of the separate wellbeing functions belonging to these branches at their nodes. One such non-linear functional form would be the product function, with indexed coefficients being the wellbeing elasticity with respect to the variables of the wellbeing function. The resulting non-linear aggregation of the wellbeing function conveys a cardinal measure of complementarities among the various variables and their relations, appearing in the formation and measurement of the wellbeing function. Among the variables of this criterion function are the policy and institutional ones. These imply the necessary condition of participation among agents in the underlying decision-making process.

The joint result of interaction among the variables and their relations lead to the compound form of the branches of the IIE-processes. Such a

compounding of mappings and relations is thus seen in terms of variables, their relations, the resulting wellbeing indexes corresponding to such branches, and their representations in the resulting wellbeing function. In this way, the attainment of complementary relations among agents, variables and their relations signifies the meaning of integration following interaction among the entities. Finally, from the continuously dynamic nature of knowledge-flows affecting decision-making, variables and their relations, emanate the evolutionary processes of further knowledge-flows and the knowledge-induced entities of world-systems.

The evolutionary nature of the interactive and integrative processes at each stage brings out the importance of a simulative method for quantitative analysis in this interactive, integrative and evolutionary methodology. The emerging method here suggests replacement of all steady-state equilibrium points by multiple evolutionary knowledge-induced equilibria. Consequently, optimization, as a method of holding the variables in an assumed end-state of equilibrium by controlled movement in the variables made possible through tradeoffs among them, is totally rejected in the IIE-process system. Optimization cannot be an acceptable method for studying IIE-process world-systems phenomena where continuous learning is in place. Therefore, in such a model, there cannot exist any terminally attained rest positions, except in the instantaneous case of the variables and, thus, their instantaneous relations and the underlying decision-making among agents. Such an instantaneous case cannot be sustained in knowledge-induced circular causation and continuity models of learning.

Besides, the presence of the unification of knowledge attained through the principle of universal complementarities and its evolutionary learning capability rejects the idea of scarcity and constriction in resource supply.

Consequently, the idea of marginal substitution to be found in neo-classical economic resource allocation is negated. The circular causation and continuity model of unified reality represented in the IIE-process makes evolutionary learning to bear permanently on risk-diversification, product-diversification, institutional development and participation among agents, variables, resources and their relation. Knowledge augmentation by means of new learning constantly reduces the risk and unit cost of production and investment through product-, risk- and economic-diversification in the framework of the unity of knowledge as signified by the principle of universal complementarities across diversity.

### ***The inter-systemic generalization of the knowledge-induced model***

Expressions (7.7) and (7.8) can now be extended to inter-systemic relations. The evolution of the interactive and integrative sequence of knowledge-flows and their knowledge-induced socio-scientific variables now yield a formulation for the wellbeing function that is interconnected across numbered

systems in respect to the number of ensuing interactions. Furthermore, in these relations, relevant variables and their relations can be included. Thus, the expressions (7.7) and (7.8) now expand and grow in complexity, but maintain order. The end result is a massive tree, whose every branch sets forth a relational order between different parts of the tree (nodes) and these are caused by knowledge-induction. Its fruits, leaves and other benefits denote the knowledge-induced result in observed forms. These forms present the divine evidence of goodness as the cause of wellbeing.

From this complex plane of knowledge formation determining knowledge-induced forms and, thereby, the wellbeing criterion, comes about growth and the evolution of processes into higher levels of similar kinds of knowledge-induced complex relations. Thus, each branch is the result of a micro-IIE-process, which then combines and co-ordinates with other similar ones to form larger IIE-processes. Such interconnections may be seen as the cause and effect of extensive and pervasive complementarities among diversity of possibilities. In the end, knowledge-flows, their knowledge-induced forms and their wellbeing function and relations are taken into account across branches of interaction, integration and evolution (IIE). We thus derive a nexus of IIE-process relations following the circular causation and continuity model of unified reality. In such a knowledge-induced nexus prevails the principle of universal complementarities among diversities of socio-scientific possibilities across systems.

### ***The epistemologically derived specific model of micro-money-real economy relations***

It is noted that every variable of the wellbeing function is of the micro-type. Aggregation to higher levels of ethical decision-making is explained by IIE-type compound mappings that result in non-linear multiplicative indexes. Although the IIE-expression (7.10) is a generalized form applicable to all types of socio-scientific problems in the framework of the *Tauchidi* unity of knowledge, its specificity to the money-real economy interrelationship will now be formulated.

The simulative form of the money-real economy relationship is explained by the following system pertaining to (7.11) in light of (7.10):

$$\text{Simulate } \{\theta_{ki}\} [W([\theta_{ki}], [X_{ki}(\theta_{ki})])]. \quad (7.11)$$

Subject to the circular causation recursive relations,

$$X_{ki}(\theta_{ki}) = f_{ji}(X_{ji}(\theta_{ji})), \quad (7.12)$$

$$\theta_{ki} = g_{ji}([\theta_{ji}], [X_{ji}(\theta_{ji})]) \quad (7.13)$$



where

$i, j (i \neq j) = 1, 2, \dots$

$k$  = monetary system;

$l$  = real economy.

All variables are to be taken in vector notation.  $f_{k,l}$  and  $g_{k,l}$  are recursive relations of the circular causation model over interactions ( $i$ ) within and between the  $k, l$ -systems.

Specifically, we can write, for money and two markets both endowed with a limiting consensual value of  $\theta_i = \theta^*$  over  $k$  and  $l$ ,

$$X_{kl}(\theta^*) = \{M_{kl}, P_{kl}, Y_{kl}\}(\theta^*) \quad (7.14)$$

where  $k, l = 1, 2$  as  $k$  = micro-money specific to two categories of spending and valuation in markets,  $l = 1, 2$ .

The nature of complementarities across diversity and dynamic evolution in the wellbeing function is causally linked with complementary relations between every one of the variables in the vector (7.14). This means that ethicizing markets emerge by complementary spending in real goods and services, whose valuation is shown in terms of micro-money supporting such complementary spending patterns. Likewise, the existence of regimes of dynamic basic needs as life-f fulfilling goods cause complementary outputs in the two sets of goods and services. There is no neoclassical type marginal substitution now. Only relative choice within a discursive framework interlinking money and real economy can exist through the medium of the *Shuratic* process.

Such unifying relations among the variables require appropriate development and policing of money-market linking instruments. Examples of such instruments are valuation in the absence of interest-based discount factors, equity and profit-sharing joint venture instruments revolving around economic co-operation, trade financing and secondary instruments that revolve around these principal ones. Above all, there is the central role played by human resource development along the lines of *Ummatic* (of the Islamic World, *Ummah*) transformation in light of the *Tawhidi* worldview. All of these knowledge-inducing factors and instruments are comprised in the  $\theta$ -induced policies and preference changes determined in, and by, the IIE-process.

When an evolution from lesser to higher regimes of micro-money and real economy linkages are being established in the knowledge-inducing systemic change,  $\theta$ -induced policies and preference changes determined in, and by, the IIE-process are, once again, active in progressively reducing the marginal substitutions between the goods and services and, thus, creating greater complementary relation between them. The unwanted goods and services are thus phased out by the  $\theta$ -induced policies and preference changes determined in, and by, the IIE-process. In this way,

the progressive evolution of the interactive and integrative processes reflects growing unification and responsiveness between the variables in a regime of change characterized by convergence between the growth rates of spending and the quantity of micro-money. This is a sure sign of progressive reduction of instability and inflationary pressure in the economy with pervasive money-real economy linkages. With gains in output arising from the side of technological change, organizational efficiency and accentuated mobilization of resources (spending), the money-economy interrelationship would yield a growth rate of output exceeding the growth rate of spending and price level. Thereby, a sustained increase in real output growth is maintained both by the endogenous allocation and the X-efficiency conditions of the money-real economy interrelationships.

We can now write down the complete form of the money-real economy relationship in light of the simulative wellbeing goal of the knowledge-centered worldview of the Islamic political economy. Because of non-linear aggregation due to interaction and relational complementarities that are embodied in the wellbeing function, we take it in the multiplicative form denoted by intersection  $\cap_{kl}$  over  $j$  variables interacting across  $(k, l)$ -systems.

$$\text{Simulate } \{\theta\} W(\theta) = \cap_{kl} X_{kl}^j \quad (7.15)$$

where  $k, l = 1, 2$  are the money and economy as the two interactive and co-determining systems.  $X_{kl} = \{M_i, M_{2i}, p_i, p_{2i}, y_i, y_{2i}\}$  is the vector of various variables pertaining to markets that are interconnected with the micro-money flows. Because of the knowledge-inducing process of the *Shuratic* kind all variables, including the  $a_i$  coefficients, are  $\theta$ -induced. We have taken this  $\theta$ -value in the limiting form.

The recursive relations according to the circular causation system are,

$$M_1 = f_1(M_2, p_1, p_2, y_1, y_2) \quad (7.16)$$

$$M_2 = f_2(M_1, p_1, p_2, y_1, y_2) \quad (7.17)$$

$$p_1 = f_3(M_1, M_2, p_2, y_1, y_2) \quad (7.18)$$

$$p_2 = f_4(M_1, M_2, p_1, y_1, y_2) \quad (7.19)$$

$$y_1 = f_5(M_1, M_2, p_1, p_2, y_2) \quad (7.20)$$

$$y_2 = f_6(M_1, M_2, p_1, p_2, y_1) \quad (7.21)$$

$$\theta^+ = f_7(\theta, M_1, M_2, p_1, p_2, y_1, y_2) \quad (7.22)$$

All of the above variables are recursively  $\theta$ -induced through the IIE-type circular causation processes. The sign "+" indicates a forward recursive value upon the lagged values of both the institutional *Shuratic* policies and preferences and the socio-economic variables. The recursive lag indicated by "-" is shown to govern all the variables inside the bracket. All the functions denoted by  $f_s$  are non-linear.

In a progressively transforming Islamic money-real economy complementary system, the coefficients of the relationships are expected to be either positive or tending towards positive signs out of progressively weakening negative relations. This signifies the passage from a non-learning system, such as the one characterized by the neoclassical marginal substitution methodology (Shackle, 1972), to increasingly pervasive complementarities as signified by the *Shuratic* process or, equivalently, the IIE-process methodology.

The above trends translate into the following analytical results. In the evolutionary life-fulfilling regimes of development promoted by the *Shari'ah*, preference changes and use of instruments selected out of discourse and extensions,  $p_i$  and  $y_i$  denote prices and outputs of such goods, respectively. Therefore,  $(p_i y_i)$ -cost of production) are distributed among participants in a co-operative Islamic political economy. This implies that the cost of production is also shared and no opportunity cost of production concept can therefore remain.

Spending in the production and consumption of  $y_i$  at prices  $p_i$  is financed by  $M_i$ . Thereby, some of the spending flows between production value and consumption value of interrelated goods and services. Equations (7.16)–(7.22) bring out this kind of interdependence. Such an interdependence follows the circular causation methodology as epistemologically derived from expressions (7.10) and (7.11).

Equations (7.16) and (7.17) are the micro-money equations for the quantity of money in circulation in multimarkets. Note that interest rates are logically ruled out in this system of relations by the absence of the opportunity cost of money and real goods and services as is otherwise expressed by their relative prices in neoclassical economic theory. Marginal substitution hypothesis is replaced by the endogenous nature of micro-money pursuing spending in interconnected multimarkets. The circular causation process in simulation by the IIE-methodology sustains the evolution of the system of diversity leading to pervasively complementary relations through the *Shuratic* process.

In the above sense, markets are not driven by the principle of invisible hands. Rather, the interconnected multimarkets become systems of social contracts driven by the measured guidance of polity (*Shura*) in view of the goal of an ethicizing market system with preference and behavioral changes (Choudhury, 1996). The epistemological derivation of micro-money equations also points out that money-real economy interrelationships are causally linked to wellbeing in the Islamic political economy. This wellbeing

criterion function is the measure of pervasively complementary relations among the critical variables. Finally, all of these are possible under the crowning episteme of *Tawhidi* unity of knowledge, both by its intrinsic nature in world-systems as well as by the guidance of the *Shari'ah* and its instruments towards realizing unity in world-systems. Herein, money and real economy complementary relations provide a significant example.

We note from the system of complementary relations (7.15)–(7.22) that well-defined circular causation exists between money and the real economy. That is to say, money is truly micro in nature as it is in pursuit of financing the *Shari'ah*-recommended life-fulfilling basket of goods and services by means of specified instruments that promote ethical values and complementarities between ethical possibilities. This makes money the valuation medium for multimarket spending. Subsequently, new rounds of multimarket spending become the springboard for a larger quantity of micro-money in the economy.

The problem of the quantity theory equation of exchange with respect to price-money causality is now overcome. Heilbroner's M-C-M process à la Marx is now replaced by the kind [Commerce-Money-Commerce-Money-etc.], induced by institutional guidance according to the unitary divine law of the *Shari'ah* ( $\theta$ -values). Besides, since there can be no possible  $\theta$ -values at the macro-economic level where decision-making, preference formation and behavior are all absent, therefore, the knowledge-induced [Commerce-Money-Commerce-Money-etc.]-process has meaning only at the micro-economic level. Money is thus micro-money and spending is interactively relational across multimarkets in the Islamic theory of money and real economy linkages.

The concepts of demand and supply of money now lose significance. Now, there is simply a quantity of currency as money available from the central authority to match a reflective spending demand in the *Shari'ah*-recommended life-fulfilling goods and services. Our old ideas of money as a medium of exchange and store of values lose meaning in this case. Since money has no market of its own, it cannot be a commodity or a factor of production. Money has no intrinsic use price. It simply comes into use after the demand signals are provided from the spending side. Consequently, money stock cannot be formed by savings in such micro-money and real transactions linkages. Monetary policies in this system cannot logically promote savings. Interest-based instruments and speculation cannot occur because of the absence of short-term rates of interest. Spending is a source for making production diversity, resulting in the ultimate reduction of cost of production by means of risk- and product-diversification. Uncertainty is, thereby, controlled and the spending variable causes the growth of money-real economy variables. Stabilization and sustainability are realized by the principal action of the circular social causation of the knowledge-induced process model across the "wider field of valuations" in dynamic life-fulfilling regimes of development (Myrdal, 1968; Choudhury, 1997).



#### 4 From methodology to methods: contrasting the Islamic micro-money and real simulation from the mainstream economic methods

Apart from the causality and aggregation problems of the equation of exchange in the quantity theory of money resulting in the inability to use this equation for developing the idea of micro-money, there are other problems that fly from the epistemological side of this body of theory into its methods. We will consider one such other problem below.

Equation (7.1) is revisited in the form,

$$MV = Py, \quad (7.23)$$

$$\text{giving, } g_M + g_V = g_P + g_Y. \quad (7.24)$$

Now, consider the micro-money version of equation (7.1). Can this be put in the form (7.24)? No. Consequently, the method of quantity theory of money in the disaggregate exchange equation does not match up the growth rates of quantity of money and of the velocity of money circulation with the growth rate of spending in multimarkets. One cannot, therefore, either aggregate from (7.1) into (7.23) or disaggregate from (7.23) to (7.1), no matter how appealing this would appear in the linear form. Consequently, we cannot derive micro-money stability and wellbeing results from the methodical conclusion so derived.

The same question, when inquired in the IIE-version of micro-money and real economy relations, yields the following result: there is no concept of macro-economic disaggregation of a stock of money  $M$  into its micro-monies equating to multimarket spending. It is possible only to aggregate the micro-monies by the spending formula in particular markets. However, this would not yield the concept of the macro-economic money stock.

For the  $i$ th multimarket:

$$M_i = Sp_i \text{ (spending in } i\text{th multimarket)} = p_i y_i + r_i c_i. \quad (7.25)$$

The intrinsic  $\theta$ -value is subsumed.

Besides,

$$r_i c_i = p_i y_i - \pi_i. \quad (7.26)$$

where

$r_i$  denotes quantity of productive factors,

$c_i$  denotes unit cost of factor use.

Thereby,

$$M_i = 2p_i y_i - \pi_i. \quad (7.27)$$

Since  $\pi_i$  is a proxy for wellbeing at the level of the firm or market, it is a simulated target function attaining a given value at the end of every completed *Shariat* process, as explained earlier. This kind of simulation is shown in Figure 7.1. We can differentiate the variables in (7.27) primarily with respect to  $\theta$ -values. The resulting equation is:

$$g_{M_i} = g_{p_i} + g_{y_i}. \quad (7.28)$$

This is the result corresponding to rates of change *with respect to the changes in  $\theta$ -values* in any given completion of process according to the circular causation model explained in expression (7.6) or (7.10). With respect to both time variable and  $\theta$ -values we must invoke the epistemological meaning that time is created by knowledge and only momentarily are they the same. This is authenticated by the *Hadith al-Qudsi* (divinely inspired Prophetic saying) in which *Allah* declares, "Sons of Adam inveigh against [the vicissitudes] of Time, and I am Time, in my hand is the night and day" (Al-Bukhari and Muslim sources of *Hadith*). Expression (7.28) can thus be aggregated to maintain the equivalence between total micro-money and multimarket spending.

Methodological differences emanating from the results of the Islamic and the *welfarist* concepts of micro-money and real economy linkages go back to the epistemological roots of these two disparate systems. The epistemes of all non-Islamic worldviews leave out the fundamental portion of the unity of divine knowledge (*Tauhid*) invoked in the epistemological outlook of the Islamic worldview. This portion is given by the causality,  $[\Omega \rightarrow_F \{\Phi\} \rightarrow_{F^*} \{\Phi^*\} \rightarrow_{G_1} \{\theta\} \rightarrow_{G_2}]$  in expression (7.6). Consequently, as we have found, the macro and the micro become two disparate dualisms of the otherwise unified socio-scientific reality. Such a dualism plays itself out in terms of micro-money as with the neoclassical marginalist philosophy in all socio-scientific constructions. The economic thought of Schumpeter (1961) and Hayek (1990) dwelled on such an open-ended evolutionary system, though they too would like to see convergence in their dialectical systems. Yet neoliberalism could not afford them anything else but the marginalist hypothesis of the neoclassical notion of goods and money as competing commodities.

According to Figure 7.1, the circular causation expressed in the  $\theta$ -induced simulation causes two kinds of  $W$  converging to  $W^*$  and evolving onwards. Either such  $W$  and  $W^*$  are optimal targets, in which case steady-state equilibrium for all the variables is configured and the novelty contributed by learning is over, or all the variables and the  $W$  and  $W^*$  functions are randomly evolutionary by competition yielding no sustained convergence. Figure 7.1 is explained below.

Let such limiting values of  $(\{\theta_{M_i}\}, [X_{M_i}(\theta_{M_i})])$  be denoted by  $(\{\theta_{M_i}^*\}, [X_{M_i}^*(\theta_{M_i}^*)])$ . The simulation path of the wellbeing function and knowledge-induced variables can now be depicted in Figure 7.1.

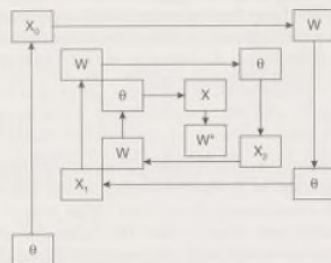


Figure 7.1 The simulation path of the wellbeing function and the knowledge-induced variables

The arrows in Figure 7.1 show the simulative direction of the convergence of the knowledge-flows, knowledge-induced variables and the resulting simulated wellbeing function. This whole process of convergence marks the completion of a given *Shuratic* process in the IIE-system.

In simplified form,  $(\theta_{1d}^*, X_{1d}^*)$  would be substituted for stage 1 in the interaction given by expression (7.11). The resulting simulated wellbeing function would then be  $W^*(\theta_{1d}^*, X_{1d}^*)$  for process 1 at the point just prior to the commencement of the second evolutionary process, and so on, in expression (7.11). The evaluation of the social wellbeing function carried out by means of the simulation method in such a perspective generates random fields of knowledge-flows caused by the fundamental nature of the unity-in-diversity of the knowledge-induced domain of socio-scientific possibilities. But these entities remain interrelated more meaningfully by complex and non-linear but monotonic functional relations determined by discoursed limiting knowledge-flows over random fields. Along with such random fields of limiting knowledge-flows, their knowledge-induced forms and the resulting compounded wellbeing functions, come about conditional probability distributions. These are topics of a more technical nature and are taken up elsewhere (Vanmarcke, 1988; Pollock, 1990; Choudhury and Korvin, 2002).

### 5 Linking up micro-money with the gold standard (dinar) in the 100 percent reserve requirement monetary system

Despite the complementary relationship between micro-money and real economic transactions guided by the *Shari'ah*, there must exist the monetary *numeraire* for this system, such that the money valuation of real transactions can be done in a way that does not bring about debasement of the

currency in terms of which micro-money will be transacted. The Prophet Muhammad's recommendation to adopt gold as the medium of monetary valuation was practiced for quite some time in the Muslim World until it was replaced, by the Egyptian Mamluk dynasty, with copper coins. This caused hyper-inflation to occur in Mamluk Egypt at the time (Allouche, 1994). It was mentioned at the beginning of this chapter that gold has proven to be the most stable precious metal over long time periods. The gold standard was taken away because of the capitalists' gregarious desire to de-link banking from the free market exchange system for their ulterior motives of earning surpluses through interest on paper money (Carmack and Still, 1998).

A return to the gold standard in any future Islamic monetary union within the purview of an Islamic common market will require economic integration defined by market-trade-growth-money interaction. Questions of economic stability and social wellbeing will be predominant in this process. The *Shuratic* process explained in this chapter would have to become the guidance forum for discourse and implementation of policies and instruments for *ummatic* harmonization and unity. The gold standard will again play its important role as the monetary *numeraire*. But what will be the *modus operandi* for introducing this great change in the midst of today's entrenched fractional reserve requirement monetary system in which paper money overwhelms the gold standard?

Two institutional changes must come about, along with serious analytical basis and the *Shuratic* process methodology, on changing to a 100 percent reserve requirement monetary system by the common weal of Muslim nations. What we are recommending here does not take into account the immense transformation consequences along Islamic lines that this will involve and create. We leave these massive details to be determined by the *Shuratic* process along its evolutionary learning trajectory as expressed by the string relation (7.6). We restrict our focus here simply to the configuration of the 100 percent reserve requirement monetary system, its relationship with the gold standard and, thereby, the emergence of micro-money and real economy linkages.

### Micro-money in the 100 percent reserve requirement monetary system, in brief

Figure 7.2 explains briefly the meaning of the 100 percent reserve requirement monetary system. The Central Bank A has authority only to discourse with the Islamic Banks B as financial intermediaries to determine the quantity of currency that must be created to finance the demand of the clientele at the Islamic Banking outlets. The Islamic banking clientele at B is denoted by C. In this figure there is no independence of B in creating money as promissory notes. There is no prime-rate discounting between A and B. Asset valuation occurs between A and B by analytical methods in



compliance with the *Shari'ah* rules on the valuation of real assets in terms of the stock of micro-money that must flow from A to C through B. C holds cashable vouchers issued by A at B, whereby fractional amounts of this voucher can be liquidated and excess amounts withheld at A. The voucher denominates an exact loanable amount to the holder in accordance with his credit worthiness that would be reflected in the personal ledger with B.

In case of excess demand for spending funds, the borrower is introduced to a *Mudharib* fund (mutual fund) in which a joint venture comes about for the project for which the excess demand for funds will be spent. In this way, only marginal additional money needs to be created as the fund becomes pooled and the cost of the fund is transferred to the cost-sharing processes between the *mudharibs*. B itself is a co-financing and overseeing *mudharib* in this multilateral relation within the market economy relationship. Joint ventures along *Mudharabah*, *Musharakah* and trade-related lines must pass their *Shari'ah* feasibility at A and B.

The same principle will hold for lending without collateral in the case of micro-credit and micro-enterprise development. A case to this effect would be the Islamic alternative for the Grameen Bank of Bangladesh (Hassan and Renteria-Guerrero, 1997). One can also have firms employing marginal groups of workers establishing development funds for the financing of exigency for these marginal workers' needs in times of company hardship facing the firms. Such development funds would offset the claim for additional funds from B. Hassan (1999) has also pointed out a detailed list of real economic activity that Islamic Bank Bangladesh engages in while undertaking micro-credit and micro-enterprise schemes.

Reserves of A now comprise all the deposits accruing from the deposits made at A by C through spending in the real economy. Every transacting agent has thus a personal reserve ledger in the computerized system that would be interactively linked between A and B. Any proportionate retention of the banking voucher made available to clientele is also deposited in the A reserves. B has thus no "excess reserve" except service charges appearing as percentages of transactions made by C plus the commissions from A. Banking clientele receive productive returns from the Islamic spending outlets.

A is the overseer of the quantity of currency to be circulated in accordance with the spending needs at C and their feasibility as advised by B to A. The income of A in all this is generated from the revenue net of cost of the sale of gold as the *numeraire* and the volume of such currency made available in accordance with real sectoral demand. This revenue flows from the real economy, where the government enters into joint ventures with the private sector in the production and management of gold bullion.

At a time, and over a region, where gold is scarce, the gold price will be high. The gold-backed currency will then be denominated high values and a number of smaller denominations will be required for smaller scale

transactions. In the end it is not necessary to buy and sell gold once a stock has been stored in A. The stock circulates between A, B and C in accordance with the denominated voucher values. Excess demand and lending without collateral would call for further gold production for which A would take advance production stocks and would get back the revenue, net of cost of production and management of such additional stocks of gold, from corresponding joint venture schemes in gold projects with the private sector.

In times of obligation to pay off outstanding international debts, A would have to call for joint ventures in debt-equity swaps or hold additional currency stock to pay off such debts. But, as the debt is being paid, A is also entrusted as a development organization with the overseeing of the Islamic transformation process. Such a transformation calls for adoption of a dynamic life-fulfilling regime of change and effective risk and production diversification by the use of Islamic financing instruments that revolve around a co-operative mechanism. A, B and C thus enter into an interactive relationship in the total process of overseeing the Islamic transformation and managing its reciprocal response. Such is the *Shuratic* process now linked to the broader echelons of similar kinds of *Shuratic* processes in the *Ummatic* system. Such extensions of the *Shuratic* system would cause linkages between the banking, market and trade systems of the *Ummah*.

The *Shuratic* process between A, B and C and its extension by the *Ummatic* transformation would give rise to a massive system of spending-linked mobilization of public and private sector resources and wealth into real sectoral activities using the *Shari'ah* instruments. Such a mobilization of resources is what is meant as the negation of savings and its replacement by the activity of spending that pursues not interest rates but real rates of return. The analytics of the money-real economy linkages have shown us, in this chapter, that the discoursed and simulated system would attain economic stability and sustainability with the enhancement of risk and product diversification. A truly participatory economy evolves toward its *Ummatic* realization. Money, markets, trade and project financing now become carriers of that change. This is the function of micro-money in relation to market activities according to the *Shari'ah* rules. It is an idea that combines the 100 percent reserve requirement monetary system as an institution with the multimarkets of the *Ummah* and mobilizes the instruments of micro-money and the *Shari'ah* rules to connect with real transactions.

Note in Figure 7.2 how specific forms of the critical variables of the simulative system (7.15)–(7.22) concern A, B and C in slightly different ways. A is concerned with the general level of prices and output based on the micro-money relationship with multimarket prices and outputs. B is concerned with the total quantity of money, with the entry of such micro-money with specific clientele-ledger and with the prevailing conditions of prices and outputs in each multimarket. These aspects are necessary to launch effective development programs in co-operation with the central bank and markets.

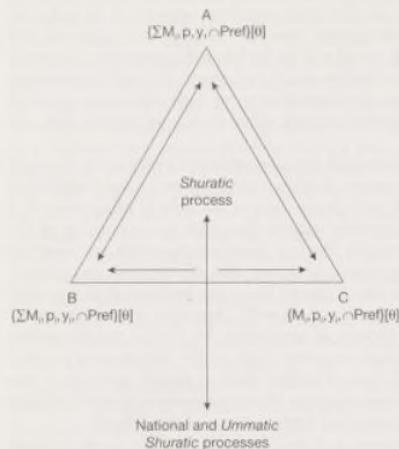


Figure 7.2 Resource mobilization in 100 percent reserve requirement monetary system

C is specifically concerned with specific multimarket conditions that inherently interact with each other. The overall interactive, integrative and evolutionary process inherent in the cumulative experience of the *Shuratic* process is realized by participatory preferences and the overall knowledge-induction. In the end, the money-market-institutional *Shuratic* process revolving around A, B and C is interconnected with the *Shuratic* process of the broader national and *Ummatic* order within a transforming *Ummah* moving towards a 100 percent reserve requirement monetary system with the gold standard.

## 6 Concepts of non-monetary *numeraire* in money-real economy relations

In recent times three alternative *numeraire* and micro-money concepts have been suggested in the literature. Yaeger (1997, pp. 412–413) writes:

Government would be banished from any role in the monetary system other than that of defining unit of account or *numeraire*. We envisage a unit defined by a bundle of goods and services comprehensive enough

for the general level of prices quoted in it to be practically steady. Merely by conducting its own accounting and transactions in this Unit – we tentatively so name it, with a capital U – the government would give private parties a strong incentive to adopt the same Unit.

Yaeger goes on:

No longer would the size of the *numeraire*, our Unit, be determined by the supply of and demand for any medium of exchange. The Unit would be defined by goods and services having supplies and demands of an almost entirely *nonmonetary* character.

Choudhury (1992) suggested an ethical basket of goods that is used by most consumers and producers to be treated as the monetary *numeraire*. Yet, such a choice of the basic needs basket, being dynamic in nature in the evolutionary trajectory of the *Shuratic* process, will have to be set by *Shuratic* discourse over time as the money-real economy interrelationship firms up and the economy develops progressively. The stability and sustainability of this change, along with the price elastic nature of the ethicized basket of basic needs, will keep prices stable over time.

Korten (1999) suggested community currency money as micro-money for transactional purposes. He recommended community currency in order to contain the flow of such currency within the community and perform productive functions. He mentions about 1,500 communities around the world that have issued their own currencies and have flourished by so integrating.

*Non-monetary numeraire* choice for purposes of fixing the smaller denominational units of the gold-backed currency was indeed practiced by the Prophet Muhammad. The Prophet used weighted measures of barley, wheat and other grains to assign certain smaller denominational values such as *dirham* and *mithqal* to coins lower in value than the *dinar* (Allouche, 1994). However, in every case, the Prophet recommended associating market values with measured baskets in terms of the value of the gold allocated in the valuation of such smaller units. Counter trade was not recommended. Currency money was thus recommended as the means for valuation of real exchange and the *dinar* was associated with the real exchange in various denominational units so as to assign a non-debased value to the market exchange and to keep such a value stable over time.

## 7 Policy conclusion

Today, on the eve of a postmodernist epoch that is dawning before us, the old socio-scientific order is up for questioning and rejection in many ways. This is giving way to new epistemological roots of intellectual inquiry, discovery and innovative applications. The Muslim World, today, is to



assess its station in this spectrum of novelty according to her own episteme of knowledge and life. Thus far, she has failed miserably on all fronts and the aftermath of a global political economy of disorder and fragmentation is upon her.

Among the many issues that assume center stage in new perspectives of the globalization scene for the Muslim World, which we refer to here as *Ummatic* transformation, will be the nature of money, monetary policy, and institutions and their relationship with the real economic transactional basis of sustainable development. In this regard, keeping in view the micro-money and real economic interrelationships, the automatic stabilization, sustainability and wellbeing effects of such an interactive, integrative and dynamically evolutionary order and the challenging new methodology and methods premised on the unity of *Tauhid* worldview, the ensuing critique of the mainstream economic order in this chapter has opened up new dimensions for serious investigation.

To attain such an *Ummatic* transformation we offer the following policy recommendations that emanate from this study:

(1) The Organization of Islamic Conferences (OIC) with its membership should galvanize the intellectuals, practitioners, public and private sectors and governments toward establishing a think-tank or a center/institute enabling discourse on ways and means of putting into action a human resource development program (Choudhury and Korvin, 2001) that would develop the pragmatic understanding of the *Shuratic* process of decision-making and put that into action.

(2) The Human Resource Development Center must be prominent on the understanding and application of the *Shuratic* process methodology for *Ummatic* change on all fronts but with a focus on the interactive and unifying dynamic relations between trade, development and real money. This calls for a policy on getting the banking systems of the Muslim World to enact a program that will incrementally change the existing banking relations based on fractional reserve requirements into a 100 percent reserve requirement monetary system with the backing of the gold standard. This monetary policy change calls for a program of establishing a monetary system that looks at the function of micro-money in terms of its direct relationship with real economic transactions. Thus, all the asset valuation methods are to be changed into this kind of forward overlapping inter-generational relationship of the real linkages. Trade and development are, then, automatically linked up with the use of endogenous money in promoting merchandise trade and capital that have linkages directly with real sectoral activities rather than with speculative portfolio investments (Choudhury, 1998, 2001).

(3) The banking community, along with the national decision-makers, Muslim intellectuals and private-sector practitioners, are to assign a program promoting linkages between money and the real economic sectors and

markets within the Muslim World over a stipulated period of time, within which a reasonable transformation into the endogenous monetary system with 100 percent reserve requirement monetary system would be realized. During this process of change growing linkages between effective sectors and activities should be subjected to the trading and developmental patterns on the basis of the on-going monetary transformation.

(4) The Muslim World should then be developing a regional trading bloc of the Muslim countries that would ultimately enact a common monetary transformation based on 100 percent reserve requirement with the gold standard. This will result in the exchange rates and a common tariff value of the Islamic customs union to be based on the economic and social productivity resulting from complementary use of resource endowments. Thus, the exchange-rate setting in such a case of the 100 percent reserve requirement monetary system would be converted into a productivity-driven indicator rather than being determined by a monetary policy of the fractional reserve requirement system, as the latter is conventionally treated exogenously in exchange-rate and interest-rate mechanisms.

(5) Islamic banks, other banks and financing development intermediaries, in concert with the national planning departments, are to establish programs to jointly fund such complementary projects as an accepted focus of trade and development in the Muslim World. The Islamic Development Bank (IDB), the Islamic Chamber of Commerce and the Statistical, Economic and Social Research and Training Center for Islamic Countries (SESRTCIC) must, together, enable the development of such linkage programs. Such programs for developing and executing complementary projects should aim at vitalizing the private sector, in co-ordination with the public sector and governments, toward facilitating such developments that build on programs of linkages along the lines of the dynamic life-fulfilling needs of development (Huq, 1997).

(6) The dynamic basic needs regimes of development would, correspondingly, define the development and trade patterns of the Muslim bloc. This kind of *dynamic basic needs regime* vis-à-vis its linked manufacturing/service sectors would be a good sign in capturing today's global trend towards green industry and to keep the gaze of technological transformation on its appropriateness in this age of "ecological revolution" (Korten, 1995). The commodity sector would then realize improving terms of trade, which is an important precondition for establishing the complementary relations between economic efficiency and distributive equity, and between trade and development with the 100 percent use of money in real economic activities.

(7) The financing modes of the Islamic transformation process must, of course, be based on co-operative joint ventures (Choudhury, 2000b). *Mudarabah* and *Musharakah* (M&M) instruments cannot continue to be understood simply as the financing instruments for specific project financing alone as they presently are. Rather, their broader meaning and effectiveness

are to be realized within the foundational meaning of Islamic socio-economic co-operation. M&M must thus be changed into policy instruments by the financial sector, in concert with the central and commercial banks and the planning departments of members of the OIC. The same M&M instruments would determine the co-operative character of all other Islamic trade instruments and secondary financial instruments. This transformation can be realized through the use of a 100 percent reserve requirement monetary system in determining the productivity-driven values of exchange rates and common tariffs of an integrating Muslim World.

(8) In every area of institutional and policy changes recommended above, the OIC with her sister organizations such as the IDB with the Islamic Research and Training Institute (IRTI), Islamic Chamber of Commerce, Islamic Corporation for the Development of the Private Sector and SESRTCIC with its Committee for Commercial and Economic Co-operation (COMCEC), must play catalytic roles in collaboration with the governments, public sector, private sector and development-financing organizations of the OIC membership. The *Shuratic* process model of *Ummatic* change must become the human resource foundation (epistemology) for guiding the progressive *Ummatic* transformation. The progress of the Islamic transformation in the years to come would then see the effective interactive, integrative and dynamic evolution of the echelons of interlinked *Shuratic* processes and their complementary relations in terms of policies, programs and economic transactions on all fronts. This is the essence of the complementary *Shuratic* processes of the *Ummah*. The OIC would then need to become the *Ummatic* governing *Shura* that connects through circular causation with the hierarchies of micro-*Shuras* through feedback in the *Ummah*.

(9) The centers/institutes cited above for facilitating the *Shuratic* transformation in the areas of trade, development, money and the real economy vis-à-vis the central role of human resource development in all of these, respecting the understanding of the *Shuratic* process in action, can be housed in IRTI and SESRTCIC or they can be launched in major Islamic universities.

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## 8 An overlapping generation valuation model with debt-equity swaps

Prevailing valuation methods in Islamic financing and debt payout by equity and venture capital outlets take recourse to the usual approaches found in the mainstream literature. These comprise discounted present valuation of cash flows (Khan, 1991), expected utility functions in risk and return behavior used for retiring debt (Ebrahim and Bashir, 1999), modeling neo-classical moral hazard behavior in the context of *Mudharabah* (Khan, 1985) and, occasionally, the game-theoretic method of financial contracting (Bashir, 1990). Upon such behavioral methods the financial picture of the Islamic bank is presented in the form of a principal-agent organization, aiming at the goal of maximizing the economic welfare of clientele by diversifying risk and increasing profit shares through Islamically permissible outlets. The liability side of the balance sheet is shown to be low, while the asset side of the T-account of an Islamic bank is viewed to be investment loaded over time (Dar *et al.*, 2001). It is, thereby, argued that the Islamic bank balance sheets would reflect robust growth of investment through Islamic channels.

The above-mentioned methods for the valuation of the Islamic bank assets and the cash flows of Islamic asset-backed resource mobilization present a vivid example of the use of such methods that do not incorporate in them the essentially Islamic methodology. This, otherwise, must combine the fundamental axiom of unifying linkages between diverse possibilities to simulate wellbeing at every stage of the firm-market-clientele interrelationship. The wellbeing objective function in this regard is understood as the Islamic criterion in which the socio-economic variables assume the progressive solidarity of the community and the *Ummah*. Variables pertinent to the valuation model are cash flows, resource mobilization attained by means of Islamic financial instruments and, upon these, the attenuating policy variables, such as human resource development along Islamic lines, control of the debt-equity ratio and institutional measures towards attaining Islamic transformation, besides simply safeguarding shareholders' wealth (Choudhury, 1993a; Choudhury and Al-Hallaf, 2001).

The above criticism of the mainstream Islamic valuation methods when applied to the theme of debt-equity swap brings out the importance of

the substantively epistemological, analytical and policy-oriented issues on asset valuation. All of these have been missed out in the received methods of valuation in much of Islamic economics.

Here is an example which commences as a question to substantiate our criticism. The present-valuation method and, thereby, the "social welfare" meaning underlying this method as expressed in terms of the axiomatic risk-return analysis fail to understand the nature of the marginalist tradeoff on which these methods rest. Consequently, these methods fail to recognize the inextricably entrenched marginalist substitution hypothesis of mainstream economics. This postulate reflects the critical debility of Islamic economics.

The essentially partitioned nature between interest-free and debt-bearing instruments and the co-operative mechanism of profit sharing in equity participation cannot logically allow for an "optimal" contractual relationship between these alternatives when a discursive process-oriented approach toward eradicating debt and replacing it with equity contracts, must permanently hold within the IIE-process methodology. Besides, the so-called "optimal" condition of the debt-equity relationship assumes existence of steady-state equilibrium. This concept, too, is merely a scientific notion that remains devoid to a process which, otherwise, must perpetually govern a transformation state by Islamic behavior.

The discounting method, so unquestionably upheld by the Islamic theoreticians and practitioners, rests on the time-value of money, which is nothing less than the rate of interest, notwithstanding any other sweeter names that are prescribed to it. Consequently, the assumptions of optimality, steady-state equilibrium, rationality axiom and time-value of money, so unquestionably used in defining the "social welfare function" in terms of equity, debt, profit-sharing ratio and interest rate, fail to recognize that these variables silently enter as "marginal substitutes" in this criterion function. Thereby, they annul the central role of unity of endogenous *interrelationships* between the variables within a discursive process-oriented methodology involving market, firms, clientele and institutions. In the latter case, agent-specific and institutional presence is required as opposed to expectations.

## Objective

Our objective in this chapter is to show that the problem of debt-equity swap in asset valuation is essentially one of bringing about a transformation process in an evolving Islamic political economy towards the *Ummah*, the Islamic global order, wherein debt is converted into equity by debt-equity swaps. The appropriate valuation model of assets, resource mobilization and assets to adopt in the midst of such a transformation process will be shown to rest on a discursive process that involves production, application and evolution of knowledge of the pervasively unifying *interrelationships*.

We will show that such a knowledge formation process attained through discourse in the *Ummatic* transformation experience can be derived only from a very specific epistemology of unity of knowledge, that of unity of the divine law (*Tawhid*), from which is derived the Islamic law, the *Shari'ah* (Choudhury, 1995a) and the subsequent configuration of the unified world-system of entities and *interrelations*.

We will show that the natural consequence of the knowledge-induced valuation model in the *Ummatic* outlook is an overlapping generation valuation model. In this model we will show how, in the midst of foreign investment, the important goal of *Ummatic* globalization becomes a development goal and is explained by the overlapping generation valuation model. Our brief case study will be on debt-equity swap in light of the new foreign investment law for retiring the burgeoning debt of Saudi Arabia in recent times.

## Formalism

Figure 8.1 shows some of the important domains of Islamic political economy as an interlinked and creative system (evolutionary system) of interaction and integration that need to be examined.

In Figure 8.1 we define the following variables:

- 1 **Socio-economic development** ( $x_1$ )
  - 1.1 A participatory political economy ( $x_{1,1}$ )
  - 1.2 An appropriate technological change ( $x_{1,2}$ )
  - 1.3 Islamic financial instruments of economic participation through co-operation ( $x_{1,3}$ )
  - 1.4 Mobilization of physical, human and technological resources by development financial instruments ( $x_{1,4}$ )
- 2 **Foreign investment** ( $x_2$ )
  - 2.1 An equity participation ( $x_{2,1}$ )
  - 2.2 A debt swap by means of equity ( $x_{2,2}$ )
  - 2.3 Debt-equity swaps as re-*Takaful* (reinsurance) investments ( $x_{2,3}$ )

Thus,  $x_1 = f_1(x_{1,1}, x_{1,2}, x_{1,3}, x_{1,4}, x_{2,1}, x_{2,2}, x_{2,3})$ ;

$x_2 = f_2(x_{1,1}, x_{1,2}, x_{1,3}, x_{1,4}, x_{2,1}, x_{2,2}, x_{2,3})$

We denote the vector  $\mathbf{x} = \{x_{1,1}, x_{1,2}, x_{1,3}, x_{1,4}, x_{2,1}, x_{2,2}, x_{2,3}\}$

## Goals

- 3 Evaluation of the complementarities gained out of participation at all levels ( $\theta$ );
- 4 Evaluation of the social wellbeing criterion,  $W(\theta, \mathbf{x}(\theta))$ , subject to the recursive *interrelationships* of an overlapping generation valuation model.



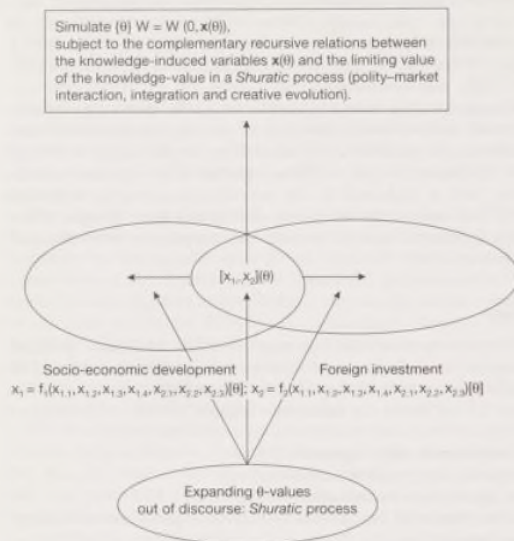


Figure 8.1 The interaction, integration and creative evolution in a knowledge-induced political economy

In Figure 8.1, the variables are endogenously *interrelated* through a circular process of feedback with the knowledge variable, say  $\theta$ , which induces all the variables in the process of discussion within institutions and through market revelation. The  $\theta$ -values are derived from textual reference to the *Ta'ahidi* unity of knowledge, and such knowledge-flows unify the socio-economic development system into a participatory political economy. That is, the knowledge-induced vector of variables is denoted by  $\mathbf{x}(\theta)$ . Note that we have taken  $\theta$  in its limiting value across many recursive discourses that take place in the context of the Islamic institutional framework of the *Shura* at any point of time. The assignment problem of  $\theta$  is a complex one in social contract theory and is not shown here (Choudhury, 2000). Besides, some of the  $x$ -variables are, themselves, vectors of other variables. For instance,  $\{x_{1,3}, x_{1,4}, x_{2,3}, x_{2,4}\} = \{\text{HRD}, R, M1, M2, M3, M4\}[\theta]$ , where

HRD denotes human resource development;  $R$  denotes physical and technological resources;  $M1$  denotes *Mudharabah*;  $M2$  denotes *Musharakah*;  $M3$  denotes joint venture and venture capital (co-operative investment) and  $M4$  denotes *Munabaha* in trade financing. All of the  $M$ -policy variables are to be denoted by their respective profit-shares or yields.

Likewise, the goals translate into a social wellbeing function,  $W = W(\theta, \mathbf{x}(\theta))$ . The social wellbeing function in this form measures the degree to which complementary recursive *interrelations* have been attained during any process of knowledge formation and its socio-economic application using the simulation method defined by the interrelationships shown in phases (1)–(4). We will call this chain of phases under the recursive reproduction of  $\{\theta, \mathbf{x}(\theta)\}$ -values a perspective of *Ummatic* transformation. While  $W$  can assume various forms, all governed by the same goal of attaining unity of knowledge through complementarities in the system of recursive relations (1)–(4), in our particular case we will take it to denote the overlapping generation valuation model. Such a candidate for the social wellbeing function can be simulated by recursively circular *interrelations* between the  $\{\theta, \mathbf{x}(\theta)\}$ -variables.

In Figure 8.1, how do the critical variables of foreign investment and its development effects enter the picture of recursive relational simulation in the midst of debt-equity swap?

Debt is liquidated by equity with that debt being sold by re-*Takaful* to foreign investors, who then treat it as equity by writing off the whole, or part, of the debt outstanding (Blackwell and Nocera, 1989). These re-*Takaful* investors thereby become *Mudharibs*, *Mushariks* or joint venture partners or a combination of these diversified equity investors and enjoy the profit-sharing privileges through re-*Takaful* in the host country. Consequently, in the *Ummatic* transformation process, there exists a recursive relationship in the (debt/equity)-ratio.

Since foreign investment as equity generates capital, while debt is a capital consumption, we write  $K(\theta, t) - D(\theta, t) = NK(\theta, t)$ , net capital stock. Debt-equity swap would need  $d(NK/D)/d\theta > 0$ . That is,  $(d/d\theta)[K(\theta, t) - D(\theta, t)] > 0$ . With exponential forms for  $K(\theta, t)$  and  $D(\theta, t)$  we obtain  $g(K)K(\theta, t)/g(D)D(\theta, t) > 1$ . Thereby,  $g(K)/g(D) > D/K$ ;  $g(K)$  and  $g(D)$  denote the growth rates of foreign investment capital and debt, respectively.

This means that, as the discursive process of *Ummatic* transformation proceeds over time, foreign investment is directed increasingly into equity participation. Of this, a portion is used to swap the foreign debt outstanding. Because it would be naive at this time to assume that all debt is converted into equity, we say that the limiting value of  $\theta$ -values over the  $\{\theta, \mathbf{x}(\theta)\}$ -recursive *interrelations* and the evolving participatory measures expressed by the simulacra  $W$ , would cause  $\delta D = dK/d\theta$ . That is, a proportion  $\delta$  of outstanding debt is converted into foreign equity as investment  $dK/d\theta$  at any point of time by the force of the knowledge-induced *Ummatic* transformation. With this case in view, we obtain the condition of debt-equity

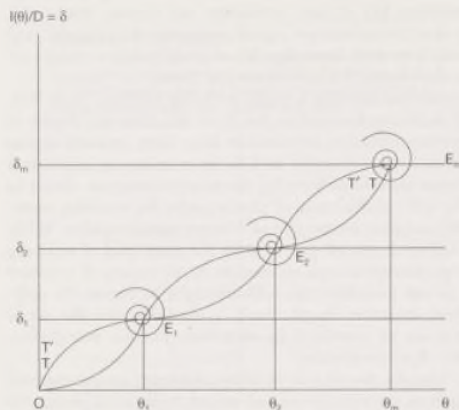


Figure 8.2 Debt-equity swaps with targeted (foreign investment/debt)-ratios in knowledge-induced discursive processes

swap as  $\delta (D/K)/g(D) > D/K$ , giving,  $\delta > g(D)$  as the condition required for effective debt-equity swap along the path of *Ummatic* transformation.

Debt is to be retired by its conversion into foreign equity capital at a rate that is higher than the rate of change of debt. It is clear from the above formulation that, because we are considering the relationship between debt liquidation by means of a certain amount of equity investment at every time, a policy-market interaction is going through the discursive process. So, as debt gets liquidated, its rate of growth  $g(D)$  declines. Now, less of capital investment is needed to finance the debt swap. Hence, the rate of growth of investment capital for debt swap,  $(g(K))$ , also declines. The relationships as deduced above do not change, however.

In Figure 8.2,  $I(\theta)/D = \delta$ , where  $I(\theta) = dK/d\theta$  denotes the simulated targeted (foreign investment/debt)-ratio with progressive knowledge induction denoted by  $\{\theta_1, \theta_2, \dots, \theta_m\}$  upon mobilizing foreign investments into interest-free *Musharakah* and joint ventures. The passage to interest-free capitalization of assets arises from the progressive retirement of debt with equity participation that yields profit-shares.

In Figure 8.2, points like  $E_1, E_2, \dots, E_m$  denote the process-oriented evolutionary equilibriums of debt-swaps with interaction, complementarities (integration) and dynamic *Ummatic* transformation (creative evolution). Such evolutionary equilibriums were studied by Grandmont (1989) and

Choudhury (1993b). All of these perspectives, together, mark the cumulative experience of the *Shuratic* process of polity-market interaction. Note that since  $\delta$ -ratios are continuously re-assigned as targets in the simulational discursive process, points like  $E_1, E_2, \dots, E_m$ , are generated in a continuum of discursive  $\theta$ -values.

Note that the interrelationships among the variables in  $x_1$  and  $x_2$  are recursively simulated in reference to the consensual  $\theta$ -variables obtained out of discourse. In this regard the cobwebs, as shown, signify convergences to such evolutionary equilibriums. Hence, the TT-curve is completely knowledge-induced and, thus, is the discursively recursive interrelationship between  $I(\theta)$  and  $D$ . TT shows the accelerated debt-swapping regime; TT' shows steady debt-equity swapping regime.

With the above relationships between  $D/K$  and  $g(K)/g(D)$ , we are now ready to formulate the overlapping generation model of valuation of foreign capital relating to the debt-equity swap. Let  $I_0$  denote the initial amount of foreign investment converted into a debt swap by an equity participation that assumes the debt. Here we have the same relation as before, namely,  $\delta.D = dK/d\theta$ . Let  $A_t(\theta, \mathbf{x}(\theta))$  denote the net cash flow from the equity investment at time  $t$  in terms of the development perspectives interrelating the vector of variables  $\mathbf{x}_t(\theta)$  that we have mentioned above. The valuation of  $A_t(\theta, \mathbf{x}_t(\theta))$  at different time periods gives the asset value of the project as debt gets swapped by equity capital,  $t = 1, 2, \dots$

At every point of time, as the institutional discourse enables the interactive, integrative and evolutionary processes to evolve, then circularly recursive interrelationships emerge (Choudhury, 1995b). The net result of these interrelationships and their further evolution is caused by the simulation of  $\{\theta, \mathbf{x}(\theta)\}$ -values through the evolutionary values of  $W$ , which now is taken as the overlapping generation valuation model. The knowledge-induced cash flows over time are shown in Figure 8.3.

At the time periods  $t_1, t_2, \dots, t_m$  there are the corresponding recursive interrelations between the  $(\theta, \mathbf{x}(\theta))$ -variables in the sense of knowledge-induced simulations. This method is explained below.

The recursive relations are shown by  $E_1, E_2, \dots, E_m$ , which are identical with similar points noted in Figure 8.2. Clearly now, an infinite-term

$$-I_0 \rightarrow A_1(\theta, \mathbf{x}_1(\theta)) \rightarrow A_2(\theta, \mathbf{x}_2(\theta)) \rightarrow \dots \rightarrow A_m(\theta, \mathbf{x}_m(\theta)).$$

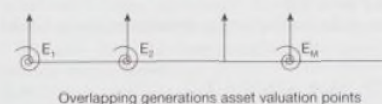


Figure 8.3 Recursively generated knowledge-induced cash flows in the forward overlapping generation valuation model



compounding is not applicable, because only finite-term decision-making is possible in the *Shu'atic* process.

$$\mathbf{x}'_t(\theta_t) = \mathbf{f}(\theta_{t-1}, \mathbf{x}_t(\theta_{t-1})). \quad (8.1)$$

Here  $\mathbf{x}'_t(\theta_t)$  denotes the vector of all variables except the one that becomes the dependent variable at a period of time in the simulation system of recursive interrelations.

$$\theta'_t = g(\theta_{t-1}, \mathbf{x}_t(\theta_t)), \quad (8.2)$$

$$\theta_t = \lim_{i \rightarrow 1-\infty} \{\theta_{0i}\}, \quad (8.3)$$

for interaction at time  $t$  denoted by  $j = 1, 2, \dots, m$  within each time period, for  $t = 1, 2, \dots, n$ .

For specificity of the variables, let  $\mathbf{x}_t(\theta_t) = \{D/K, g(K)/g(D), d\}[\theta_t]$ . Take  $\theta_t$ -values to be consensually derived knowledge values over time and centered on directing foreign investment into debt-equity swaps through the doors of *Musharakah*, joint ventures, *re-Takaful*. Thereby, interest-based financing is effectively replaced by a profit-sharing financing instrument. All such development financing instruments, together, bring about the *Ummatic* transformation. Any such possibility of *Ummatic* transformation is signified by the evolving regime of  $\{\theta_{t-1}, \mathbf{x}_{t-1}(\theta_{t-1})\}$ -values over time. Consequently, evolutionary simulated values of the wellbeing function,  $W$ , are attained. More on these issues follows.

Every flow of foreign equity capital like  $I_0$  used in debt-equity swap, yields a terminal value of cash flows or asset valuation at time  $t$  equal to  $A_t(\theta_t, \mathbf{x}_t(\theta_t))$ , which then accumulates by the equity profit-sharing rate till maturity of the debt-equity swap. All such values are determined and accumulated recursively from the previous cash flows. These complementary interrelationships enter the wellbeing function,  $W(\theta_t, \mathbf{x}_t(\theta_t))$ .

We now have the overlapping generation valuation model based on the simulated  $\{\theta_t, \mathbf{x}_t(\theta_t)\}$ -values. An appropriate selection of the  $\mathbf{x}_t$ -vector is  $\{(K/D)\text{-ratio}, \{g(K)/g(D)\}\text{-ratio}\}$ . These two ratios are moved towards equality with each other by means of a discursive control of the  $\delta$ -parameter in the presence of limiting  $\theta_t$ -values. In this case as well, the  $\delta$ -parameter would be treated as a policy control variable. The simulative trajectory is then of the type shown in Figure 8.2.

The complete simulation of the overlapping generation valuation model is given by:

$$\text{Simulate}\{\theta_t\} W(\theta) = \sum_{t=1}^n [A_t(\theta_t, \mathbf{x}_t(\theta_t))] - I_0, \quad (8.4)$$

with  $\theta$  denoting the sequence of consensual  $\theta_t$ -values over time, subject to the knowledge- and time-dependent recursive interrelations shown in (8.1)–(8.3).

With  $\mathbf{x}_t(\theta_t) = \{D/K, g(K)/g(D), \delta\}$ , we would have the following kind of simulative knowledge-induction: as foreign investments  $I(\theta_t)$  are directed into *Musharakah* projects through *re-Takaful*,  $(D/K)$  tends adaptively towards  $\{g(K)/g(D)\}$ , as  $\delta$  assumes a value near to unity when all of debt is swapped by a proportion of the foreign investment flow. Simulative  $\theta_t$ -values appear from the discursive decision-making and polity-market processes by dint of using ways and means for effectively mobilizing such foreign investments into *Musharakah* projects, and in sustaining complementary relations between debt reduction and equity swaps, and as an interest-based regime is progressively replaced by *Musharakah* profit-sharing rates.

In this specific case of debt-equity swap the wellbeing criterion means the sum-total of all debt write-offs by the progressive upward movement of the  $\delta$ -ratios as shown in Figure 8.2.

For the particular case where cash flows denote compounded values of profit-sharing rates  $(r_t)$  at every time period, we take  $\mathbf{x}_t(\theta_t) = r_t(\theta_t)$ .

$$W(\theta) = \sum_{t=1}^n A_t(\theta_t, \mathbf{x}_t(\theta_t)) = \sum_{t=1}^n [A_t(\theta_t) \prod_{i=1}^n (1+r_i(\theta_i))] - I_0. \quad (8.5)$$

If we assume deductions from the asset value over time, say,  $dt$  at time  $t$ , the expression (8.5) takes the form:

$$\begin{aligned} W(\theta) &= \sum_{t=1}^n (1-d_t) A_t(\theta_t, \mathbf{x}_t(\theta_t)) \\ &= \sum_{t=1}^n [(1-d_t) A_t(\theta_t) \prod_{i=1}^n (1+r_i(\theta_i))] - I_0. \end{aligned} \quad (8.5a)$$

The simulation of  $W$  is now subject to the complementary recursive relations,

$$r_t = f_t(\theta_{t-1}, r_{t-1}) \quad (8.6)$$

where  $r_t$  itself can be an expected value of a system of rates of returns obtained from the debt-equity swap portfolio with different contingencies across diverse projects that may prevail. This part of the contingency-based averaging process is not shown (see Hirschleifer, 1970). See Choudhury (1999) for a version of the intergenerational valuation model in Islamic perspective.  $r_t$  would be better represented by geometric averaging than arithmetical averaging, because of the underlying term structure of the rates subject to different contingencies and portfolios, all simulated under non-linear complexity by recursive knowledge-induction.

We also have the  $\theta$ -assignment problem as in the *Shu'atic* discursive process shown above by:

$$\theta_t = \lim_{i \rightarrow 1-\infty} \{\theta_{0i}\}. \quad (8.7)$$

Interactions at time  $t$  are denoted by  $i = 1, 2, \dots, m$  for  $t = 1, 2, \dots, n$ .

For several equity projects used in swapping debts with a sequence of foreign investments,  $I_s$ , say,  $s = 1, 2, \dots, S$ ,  $t = 1, 2, \dots, n$ , starting and terminating at the same or different points in time in the future, the above valuation model would be a sinking fund of such foreign investment flows:

$$W = \sum_s \sum_t A_{st}(\theta_{st}, x(\theta_{st})) = \sum_s \sum_t [A_{st} \Pi_{t-1} (1+r_{st})] (\theta_{st}) - \sum_s \sum_t I_{st}(\theta_{st}). \quad (8.8)$$

The complementary recursive relations are once again of the type:

$$r_{st} = f(\theta_{j-t-1, s}, r_{j-t-1, s}), \quad (8.9)$$

where  $r_{st}$  means the profit-sharing rate in a project that is co-operatively complemented with all other projects,  $s = 1, 2, \dots, S$ . Such joint ventures and *Musharakah* projects would be multilateral projects in the *Ummah* (Choudhury, 1997). The equivalence for the expression (8.5a) can be readily formulated.

The general version of the above model can be replicated as in the phases (1)–(4) for *Ummatic* transformation mentioned earlier in this chapter. Only in this general form do we see the complementary effects between foreign investment and economic development, the latter being now understood as complex interrelations between the goals of intersecting socio-economic development with foreign investment in a knowledge-induced discursive system as represented in Figure 8.1. Socio-economic development is thus a complex process of simulating wellbeing by systemic interaction, consensual selection and creative evolution of knowledge-induced relations within institutions in respect of their policies, decisions and programs, and in relation to the polity-market interdependence understood in the broadest sense of the *Shuratic* process (*Qur'an*, 42:49–53). The *Shuratic* process is thus not limited to political and institutional consultation alone. It is extended to the relational phenomena of the world-system wherein the mind observes the *Tawhidi* essence of systemic unity.

In this context, an Islamic equity project such as *Musharakah* used in debt-equity swap is driven by the goal of evolving wellbeing attained through participation, as explained by complementarities between diverse projects in terms of the interrelations between the polity-market variables. Such a participatory venue establishes the condition for replacing the rate of interest by the profit-sharing ratio. Without such an endogenous use of foreign investment with respect to its mobilization into equity projects for swapping debt, it would not be possible to effectively replace an interest-bearing financial system by profit-sharing alone or by any degree of policy and institutional intervention.

One can see the significance of the overlapping generation valuation model in evaluating interest-free regimes of *Ummatic* transformation through the debt-equity swap. The discounted present valuation method and utility maximization approach to the same issues are unable to address the issue of debt-equity swap because of the presence of opportunity cost between

debt and equity in these methods. In these models the opportunity cost is given by the ratio of the rate of interest corresponding to debt and the rate of return corresponding to equity. Resource allocation for capital formation would then move according to the attractiveness of this ratio across divergent regimes of interest-rates and profit-sharing rates.

In the overlapping generation valuation model, discourse at every point of the recursive trajectories of decision-making, policy formulation, guidance and polity-market interaction causes evaluation of the cash flows according to the actual or expected profit-sharing rates earned from the debt-equity swaps in relation to the prevailing economic conditions and in accordance with the *Shari'ah* possibilities and instruments that can be enacted. Now, no opportunity cost between debt and equity can exist when the debt as cost in equity participation is mutually shared and diversified at every time period in relation to polity-market interaction. The cash flows that emerge are either actual or expected ones at the intergenerational points of time. For these variables, no assumed discount rate as opportunity cost needs to be assumed as in the discounted present valuation and utility methods. The markets, resources, outcomes and preferences are better known and estimated at the intergenerational evolutionary points of valuation. Finally, such markets are continuously learning which, in the regime of declining debt burden by its equity swap, can be seen as an important aspect of the ethicizing market transformation.

### Quantitative directions in the overlapping generation valuation model

The principal information required for the overlapping generation valuation model is the limiting value  $\theta_i$  of the discoursed knowledge values  $\{\theta_{st}\}$  over interactions (i) and time (t), as in the *Shuratic* process methodology. Next, there is the data requirement for the knowledge-induced socio-economic variables,  $\{x_i(\theta_i)\}$ . These, together, enter the  $W(\theta_i, x_i(\theta_i))$  function, as shown before. The important aspect of the feedback shown in Figure 8.4 brings out the specific nature of information generation for the valuation model.

There are two ways to generate  $\theta_i$ -values and the  $\{x_i, \cap x_i\}[\theta_i]$  feedback (Choudhury, 2000):

- 1 The discursive *Shuratic* process is based on the methodology of the rhetoric of economics (McCloskey, 1985) and is adopted at every point of interaction, integration (consensus value). These values institutionally assign ordinal  $\theta_i$ -values in terms of the feedback.
- 2  $\theta_i$ -values are assigned numerical values, such as,  $\theta_i \geq 1$  (high value),  $\frac{1}{2} \leq \theta_i \leq 1$  (medium value),  $0 \leq \theta_i \leq \frac{1}{2}$  (low value) based on the performance of the guidance, policies in concert with the market realities. The values of  $\{\theta_i, x_i(\theta_i)\}$  are then recursively determined.



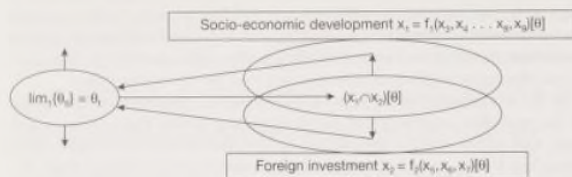


Figure 8.4 Recursive feedback and knowledge-induced expansion of the interactive, integrative and evolutionary sets

For example expression (8.3) can be specified as follows:

$$\begin{aligned} 20\% \leq \delta = (1/D)[1 \leq \theta] \leq 50\%, \text{ or, } 10\% \leq r \leq 20\%; \\ 10\% \leq \delta = (1/D)[\frac{1}{2} \leq \theta \leq 1] \leq 20\%, \text{ or, } 5\% \leq r \leq 10\%; \\ 0\% \leq \delta = (1/D)[0 \leq \theta \leq \frac{1}{2}] \leq 10\%, \text{ or, } 0\% \leq r \leq 5\%. \end{aligned}$$

### Foreign investment and equity participation in Saudi Arabia in the perspective of the overlapping generation model with debt-equity swap

The Government of Saudi Arabia's new foreign investment law (Saudi Arabia online a) on the free flow of foreign investment in, and from, the country was recently passed in accordance with the *Shari'ah* laws and with the ordinance of the central *Shura* in concert with the High Council. These laws deal with foreign investment matters, particularly land ownership and the option for foreign investors to enjoy sole proprietorship of investments and tax holidays. Yet the *Shari'ah* appropriateness of foreign investments is to be strictly applied. Foreign investment privileges are given, particularly, to infrastructure projects, and manufacturing and agricultural projects. Substantial tax benefits would be awarded to foreign investors. As a result of the Saudi new foreign investment law some major foreign investors have won lucrative contracts (Saudi Arabia Online). Particular note is made here to the foreign investment bid of \$145 million from Saudi Telecom to Lucent Technologies in the area of an optical data network contract. Saudi Chevron Petrochemical won a joint venture for a \$650 million plant to produce benzene and cyclohexane. There are many more such projects for which foreign investment data are not available but are expected to be a massive total amount.

It is clear from the available statistical information (Saudi Arabia Ministry of Planning, 2001; US Mission, 2002) that equity and joint venture

participation, which are encouraged under the Saudi new foreign investment law, can play a significant role in writing off Saudi Arabia's outstanding debt by a policy encouraging foreign investments to swap the total of US\$22.4 billion external debt outstanding (Economic Intelligence Unit, 1996).

The  $\delta = (1/D)$ -ratio stood at 66.96 percent in 1998. But, of this, if we take 10 percent to be allocated annually in debt-equity swap, Saudi Arabia can hope to write off her foreign debts outstanding in about five years, given the high investment bids that are now being given to foreign investors in Saudi Arabia under her new foreign investment plan. The discourse ( $\theta$ -related) and the attractiveness of productive returns from economic development that will go with foreign investment converted into debt-equity swap will need the active participation of the Saudi *Majlis as-Shura* and the High Council with national and foreign investors, giving the latter sufficient incentives on adopting debt-equity swaps, just as land ownership and tax exemption are being offered as attractive incentives under the new investment law. In this way, from an active developmental viewpoint, the overlapping generation valuation model would be suitable in carrying forward the discursive results. In such a case, the  $\delta$ -ratio would be applied annually in the perspective of the returns to be expected from the corresponding debt-equity swaps so attained by the corresponding moving  $\delta$ -ratio (Figure 8.2).

With 10 percent of external debt swapped annually by foreign investment and assuming that 1–5 million dollars are generated in benefits annually, we can think of an annual rate of return of about 5–10 percent in the short term. The overlapping generation asset valuation model now takes the form:

$$W = \sum_c \sum_n A_n(\theta_n, \mathbf{x}(\theta_n)) = \sum_c \sum_n [A_n \Pi_{t=1}^n (1+r_n)] [\theta_n] - \sum_s \sum_t I_s(\theta_s). \quad (8.10)$$

The complementary recursive relations are once again of the type,

$$r_{j^s} = f(\theta_{j-1, s}, r_{j-1, s}), \quad (8.11)$$

$$\begin{aligned} \$1m \leq A_n \leq \$5m; 0.05 \leq r_n \leq 0.10; 10\% \leq \delta \\ = (1/D)[\frac{1}{2} \leq \theta \leq 1] \leq 20\%. \end{aligned} \quad (8.12)$$

$$t = 1, 2, \dots, 5; s = 1, 2, \dots, m.$$

### Conclusion

We have explained in this chapter that many of the mainstream valuation methods used by Islamic economists and financial firms are incorrect in view of their irrelevance and contradiction to the epistemological premise of *Tawhid*. *Tawhid* is used here to explain systemic unity of knowledge-flows and their induced variables in the absence of interest-based valuation

in that systemic approach. Such valuation models cannot, therefore, have any bearing on *Ummatic* transformation. The *Ummatic* transformation is the equivalent of globalization in the Islamization sense.

Contrarily, some significant cause and effect relationships in *Ummatic* transformation emerge from the endogenous treatment of the process-oriented interrelations between socio-economic variables. In this chapter, the selected socio-economic variables were debt-equity swaps and foreign investment with development effects being conveyed by *Musharakah*, joint ventures and other relevant Islamic financing instruments. Such process-oriented interrelations are premised on a continuous production of knowledge in the system of extended discourses yielding complementarities. These are shown to go on between agents and the polity-market domain. It is, indeed, an experience in ethical transformation of markets by knowledge production and recursively simulated integrative relationships with creative evolution (the IIE-process methodology).

All such latter kinds of ethical transformation that are attained progressively through a simulative process and evolutionary methodology, rather than by an optimal and steady-state methodology based on economic rationality, are comprehensively built into the overlapping generation model of asset valuation. This model is epistemologically derived from a conscious recognition of the fundamental epistemology of unity of systemic knowledge (*Tawhid*) and is applied to asset valuation in general. We have applied it to the case of debt-equity swap with foreign investment and its development impact in the context of a progressive *Ummatic* transformation.

The case of Saudi Arabia was briefly examined in light of the potential usefulness of the overlapping generation model of valuation to swap debt outstanding with the massive foreign investment flows in the face of her new foreign investment law. Yet, the data on Saudi foreign investment shows an insignificant foreign investment relationship of Saudi Arabia with the Muslim World. The principal foreign investors in Saudi Arabia happen to be the US, Japan, United Kingdom, Switzerland, France and Germany. Saudi Arabia maintains close to 47 percent of her foreign investment with the US. The overlapping generation valuation model points out normatively the central role of participation and discourse among diverse equity participants that can lead to the sharing of costs, risk and profits. In this process, increasing numbers of foreign investors from Muslim countries are to be taken as gainful partners.

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## 9 A knowledge model of layers of techniques

The objective of this chapter is to substantiate the praxis of the knowledge-centered worldview as derived from the *Qur'an* and to show how this praxis applies to the specific case of technological change in a very practical way of unification of knowledge within the technological epi-phenomenon of the automobile industry in Malaysia. The characterization of dynamic technological change in the knowledge-induced sense will lead to an examination of the theory of knowledge-induced layers of techniques. Yet, here, we show how the knowledge-induced praxis, applied to technological change, presents an altogether different meaning to the concept of layers of techniques, which is contrary to the theory and implications of layers of techniques in the mainstream economic literature.

The chapter is in the following sections. Section 1 introduces a substantive conception of knowledge as an epistemology in models of technological change. The functional aspect of the knowledge model is derived in this section from the Islamic worldview of unity of knowledge (*Tawhid*) in the way that this praxis applies to practical problems. The example sought here is presented in Section 2 of the chapter in terms of the theory of knowledge-induced layers of techniques. In Section 3 we apply this knowledge-induced dynamic model of layers of techniques to the case of technological evolution in the automobile industry in Malaysia. Section 4 is a conclusion on the substantive nature of the perspective of knowledge-induced technological change in contrast to the mainstream theory of embodied technological change. In every case, the use of the knowledge-centric relations is of the substantive nature in the sense of the *Tawhidi* worldview.

### 1 THE ANALYTICAL BACKGROUND OF THE STUDY: ISLAMIC EPISTEMOLOGY OF UNITY OF KNOWLEDGE

The unity of knowledge is understood in Islam as the completeness, absoluteness and perfection of divine knowledge that is *Allah's* alone and from which knowledge premise ensues flows of knowledge as *Allah* wills it by His divine command to the world-systems. This divine command takes

the form of the universal law called *Sumat Allah*, which is then concretized in the form of the worldly law of Islam called the *Shari'ah*. The understanding of the episteme of the divine law and the emanation of the *Shari'ah* from that foundational source for deriving rules of worldly conduct, application and inference, forms a process that is summarily presented here by means of a chain of relations explained below, which we will explain and apply to the specific theme of technological change.

Let  $\Omega$  denote the *Tawhidi* fullness of divine knowledge understood as Oneness in terms of the absoluteness, perfection and completeness of this foundational episteme.  $\Omega$  is, therefore, treated as a topology to make it functional in world-systems by defining all relations and entities that emanate in these domains. Yet,  $\Omega$  is not configured by any quantitative measure. To preserve these two essences of the Oneness of *Allah* in Islam, we characterize  $\Omega$  as the super-cardinal topology (Choudhury, 1995), rather than being infinite in dimension, which otherwise would result in meaningless relational orders with the rest of the world-systems that *Tawhid* stands to explain. Instead, the super-cardinal topology defines relational orders that have causality between them in relation to the topological measurable function of the open super-cardinal space of completeness of knowledge, *Tawhid*, on the world-systems. Thus, the *Tawhidi* relational order becomes well defined and it entirely explains the world-system that is premised on the foundational episteme of *Qur'anic* unity of knowledge (*Tawhid*). This kind of functional characterization of  $\Omega$  in relation to the world-systems is established on the basis of *Qur'anic* inference (*Ahkam*): "No just estimate of *Allah* can you form" (*Qur'an*, 24:42, 32:5). Yet *Allah* is the Originator of the heavens and the earth and in which He changes creation as He wills and *Allah* is able to do all things (*Qur'an*, 35:1). The divine law is inscribed in the Tablet that is in His protection (*Lauh Mahfuz*) (*Qur'an*, 85:21–22).

### Revisiting the *Tawhidi* mathematical epistemology: knowledge and "de-knowledge"

From  $\Omega$  flow the incessant springs of guidance and laws that together define simultaneously the truth (knowledge) and falsehood (de-knowledge) as the only two opposite parts of total reality. The flows of knowledge are denoted by the set  $\{\theta\}$ . Its opposite (the "mathematical complementation" in topological domain), i.e. de-knowledge, is denoted by the set  $\{\theta\sim\}$ . These two opposites form the "mathematical complementation" of the two opposite kinds of sensations that flow from  $\Omega$  alone. Thus,

$$\Omega = \{\theta\} \cup \{\theta\sim\}; \{\theta\} \cap \{\theta\sim\} = \phi \in \Omega \quad (9.1)$$

where

$\{\theta\} \in \Omega$  denotes the accumulation of knowledge-flows across all world-systems;

$\{\theta \sim\} \in \Omega$  denotes the accumulation of de-knowledge-flows (falsehood) across all de-knowledge world-systems;  
 $\{\theta\}$  and  $\{\theta \sim\}$  are thus taken up in the sense of the unique command of  $\Omega$  both over knowledge and de-knowledge as truth and falsehood, respectively, establishing the final criterion which, in *Qur'anic* terminology, is called *Furqan*.

Likewise, among the entities of the *Tachid* world-systems are the two kinds of opposite realities,  $\{\mathbf{X}(\theta)\}$  and  $\{\mathbf{X} \sim(\theta \sim)\}$  corresponding to the opposite world-systems that are created by truth and falsehood, respectively. The following are the properties of these knowledge and de-knowledge-induced entities:

$$\{\mathbf{X}(\theta)\} \cup \{\mathbf{X} \sim(\theta \sim)\} = \mathbf{H}; \{\mathbf{X}(\theta)\} \cap \{\mathbf{X} \sim(\theta \sim)\} = \phi \in \mathbf{H}. \quad (9.2)$$

Since,  $\{\mathbf{X}(\theta)\} \cap \{\mathbf{X} \sim(\theta \sim)\} = \phi \in \mathbf{H}$ , and this  $\phi \in \Omega$ , therefore, either of these two is possible:  $\mathbf{H} \in \Omega$  or  $\Omega \in \mathbf{H}$ .

$$\text{Hence, } \Omega = \mathbf{H}. \quad (9.3)$$

Expression (9.3) gives a strong result of central importance. It establishes the *Qur'anic* meaning that the completion of all knowledge-flows and their bestowing in terms of the perfection of the knowledge-induced entities appears in the Hereafter. Hence, the Hereafter is equivalent to *Tachid* in terms of the super-cardinal measure of these equivalent topologies. Yet, the subtle difference is that though *Allah* can never be configured in the primordial sense and in the final event of the Hereafter, yet the rewards of the fullness of the complete order of knowledge optimizes the rewards and the punishments to their fullest in Heaven and Hell, respectively. Thus Heaven and Hell are realities of the knowledge-induced fullness and the de-knowledge-induced fullness in the respective super-cardinal topological spaces.

We have thus established the following process by which the *Qur'anic* universe (*Alameen*) learns: "From  $\Omega$  in the primal to  $\Omega$  in the Hereafter through the process of the world-systems." This causation is now written down as follows:

$$\Omega \begin{cases} \nearrow \{\theta, \mathbf{X}(\theta)\} \rightarrow \Omega = \mathbf{H}, \text{ accumulation of} \\ \quad \text{knowledge-flows for judgment in Heaven} \\ \searrow \{\theta \sim, \mathbf{X} \sim(\theta \sim)\} \rightarrow \Omega = \mathbf{H}, \text{ accumulation of} \\ \quad \text{de-knowledge-flows for judgment in Hell.} \end{cases} \quad (9.4)$$

Along with expression (9.4) we must include the properties for the expressions (9.1)–(9.3).

We derive the following result from expression (9.4); because of the topological properties given in expressions (9.1) and (9.2), it would be contradictory for the following results to be true:

$$\left. \begin{aligned} \{\theta_1\} \cap \{\theta_2\} &= \phi, \text{ for any } \{\theta_1\}, \{\theta_2\} \in \{\theta\} \\ \text{and} \\ \{\mathbf{X}_1(\theta_1)\} \cap \{\mathbf{X}_2(\theta_2)\} &= \phi, \text{ for any } \{\mathbf{X}_1(\theta_1)\}, \{\mathbf{X}_2(\theta_2)\} \in \{\mathbf{X}(\theta)\}, \end{aligned} \right\} \quad (9.5)$$

for then these knowledge and knowledge-induced values will share the property of de-knowledge within their own domains and will reflect the de-knowledge values, thus leading to a contradiction. Therefore, all knowledge-flows and their induced forms and relations in the respective topologies are interrelated in the most extensive sense in the process chain, " $\Omega$  in the primal to  $\Omega$  in the final as  $\Omega = \mathbf{H}$  through the process of the knowledge-induced world-systems." This is the principle of interaction between diversity of opportunities and presents the pervasively interactive process that remains embedded in the formation of knowledge-flows (*Ilm*) and their induced forms (*Ayah Allah*). The totality of these knowledge-induced entities forms the *Qur'anic* world-system (*Alameen*).

Since the knowledge domain is pervasively characterized by the episteme of unity of knowledge, therefore, interaction between all entities in the set  $\{\theta, \mathbf{X}(\theta)\}$  must lead to confirmation of the unification process, as derived from the episteme of  $\Omega$ . The convergence of the process of interaction between diversity to convergence as unification, is called the stage of integration. The two stages, namely from interaction between diversity leading to convergence or integration (unification), are, together, termed as the interactive and integrative stages of knowledge formation and the derivation of their induced entities in the *Qur'anic* world-system.

Finally, we invoke the continuous process shown in expression (9.4) along the knowledge-chain. It shows that the cumulative process of knowledge formation and the realization of its induced forms in the *Qur'anic* world-system remains incessantly evolutionary in the  $\{\theta, \mathbf{X}(\theta)\}$ -tuples, with the limiting *Qur'anic* universe of relations, namely, " $\Omega$  to  $\Omega = \mathbf{H}$  through the process of the world-systems."

### The social wellbeing function

Yet, it is now important to note how the knowledge evolution comes about from one stage of knowledge formation and its induced forms to subsequent stages of the same kinds of organic forms. The end of any completed interactive and integrative stage is immediately followed by the post-evaluation of the actions, policies, programs and inferences adopted in that stage. This evaluation is based on a discursive institutional examination of the degree of unification attained at that stage, the quantitative



evaluative function, which is called the social wellbeing function. We denote it by:

$$W = W(\{\theta, X(\theta)\}), \text{ with } dW/d\theta > 0; dW/dX(\theta) > 0. \quad (9.6)$$

Because of the complexity of the knowledge-formation process in the extensively interactive *Qur'anic* world-system,  $W$  appears in a suitable non-linear multiplicative form rather than a linear form. The multiplicative form signifies that interactions, integration and evolutionary learning take place between relational systems, agents, variables and their functional relations. Within such IIE-process domains are the spaces of science, technology, institutions, markets, ecology, society, the global order, etc.

It is from the post-evaluation of the interactive and integrative stages attained in any given round of knowledge production and its induced forms that a new round of the same kind of process re-originate. Such a re-origination marks the emanation of the knowledge-evolutionary process and of the knowledge-induced world-system. At such a post-evaluation point we have completed the characteristic of one full process in the knowledge-induced space. We have now completed the interactive, integrative and evolutionary character of the knowledge-formation process in the *Tawhidi* epistemic worldview. We will refer to this interactive, integrative and evolutionary process as the IIE-process and methodology. It is equivalent to the *Shuratic* process and methodology.

### Extension to systems of interaction

Expression (9.4) is now expanded in the following form for the knowledge chain:

$$\begin{aligned} \Omega \rightarrow \{\theta\} \rightarrow \{[\{\theta\}] \rightarrow X[\{\{\theta\}\}] \rightarrow W[\{\{\theta\}\}], X[\{\{\theta\}\}]\} \\ \rightarrow \text{a new similar process} \rightarrow \dots \Omega = H. \end{aligned} \quad (9.7)$$

More generally, for the  $i$ th complete *Shuratic* process ( $i$ ) for a specific issue ( $j$ ) under discourse or process ( $k$ ),  $i = 1, 2, \dots, m$ ;  $j = 1, 2, \dots, n$ ;  $k = 1, 2, \dots, K$ , we write:

$$\{[\{\theta_j^i\}] \rightarrow X_j^i[\{\{\theta_j^i\}\}] \rightarrow W_j^i[\{\{\theta_j^i\}\}], X_j^i[\{\{\theta_j^i\}\}]\}_k. \quad (9.8)$$

Expression (9.7) can be further extended by including the numbered interaction ( $i$ ) on a specific issue ( $j$ ) under discourse and across interactive systems ( $s$ ), as in the case of the study of political economy that interlinks economy, society, institutions, the global order, etc. We then write (9.7) as:

$$\{[\{\theta_j^{is}\}] \rightarrow X_j^{is}[\{\{\theta_j^{is}\}\}] \rightarrow W_j^{is}[\{\{\theta_j^{is}\}\}], X_j^{is}[\{\{\theta_j^{is}\}\}]\}_k \quad (9.9)$$

where

$$\begin{aligned} i &= 1, 2, \dots, m; \\ j &= 1, 2, \dots, n; \\ s &= 1, 2, \dots, S; \\ I &= 1, 2, \dots, N_i; \\ k &= 1, 2, \dots, K. \end{aligned}$$

These strings of relations can be further extended to interconnect across the nexus of other diverse relations, systems, agents and entities. The resulting complex nexus can be described by multiple branches that emanate by assignment of values to the subscripts and superscripts in expression (9.9) (Choudhury, 1999, 2000a).

### The *Tawhidi* string of causation in world-systems: a generalized formalism

Now with the details of the transmission mappings that define the fundamental *Tawhidi* epistemology and combine it inseparably with the ontology of the *Sunnah* and the ontic induction of cognitive artifacts by the unity of knowledge in the *Qur'an* and the *Sunnah* in world-systems, we finalize the following string of *Tawhidi* causation (Choudhury, 1994):

$$\begin{aligned} \Omega \rightarrow_{\text{revelation}} \{\theta\} \rightarrow_{\text{Sunnah}} [\{\theta_j^{id}\}] \rightarrow X_j^{id}[\{\{\theta_j^{id}\}\}] \rightarrow W_j^{id}[\{\{\theta_j^{id}\}\}], \\ X_j^{id}[\{\{\theta_j^{id}\}\}]\}_k \rightarrow \text{a new similar process} \rightarrow \dots \Omega = H \end{aligned} \quad (9.10)$$

where

$$\begin{aligned} i &= 1, 2, \dots, m; \\ j &= 1, 2, \dots, n; \\ s &= 1, 2, \dots, S; \\ I &= 1, 2, \dots, N_i; \\ k &= 1, 2, \dots, K. \end{aligned}$$

The subscripts, "revelation" and "*Sunnah*" in expression (9.10) signify the primal transmission of the knowledge of unity from  $\Omega$  onto the nexus of world-systems that are discoursed and creatively evolved from the fundamental epistemological roots. Thereafter, the process  $[\cdot]$  shown in expression (9.10) forms the functional understanding and application of the *Shar'iah* to the nexus of world-systems. The origin of the *Shuratic* discourse leading to the construction of the *Qur'anic* world-system emanates from the *Qur'an* and the *Sunnah* as the exogenously given laws to define the endogenous process of the discourse and its subsequent *Shuratic* effects, where rules are enacted, changed and evolved. This is the stage of  $\{\theta_j^{id}\}$ . Now the two parts of the Islamic knowledge premises are combined by an exogenous part and an endogenous part as follows:

$$\begin{aligned}
 &[\Omega \rightarrow_{\text{revelation}} \{\theta\} \rightarrow_{\text{So=Sumah}} \{\{\theta_j^{\text{ad}}\} \rightarrow X_j^{\text{ad}}(\{\theta_j^{\text{ad}}\}) \rightarrow W_j^{\text{ad}}(\{\theta_j^{\text{ad}}\}, X_j^{\text{ad}}(\{\theta_j^{\text{ad}}\}))\}]_k \\
 &\quad \text{Exogenous} \qquad \qquad \qquad \text{Endogenous} \\
 &\qquad \qquad \qquad \rightarrow \text{a new similar process} \rightarrow \dots \Omega = H. \quad (9.11)
 \end{aligned}$$

## 2 LAYERS OF TECHNIQUES EXPLAINED BY THE FORMALISM OF THE TAWHIDI KNOWLEDGE-INDUCED TECHNOLOGICAL CHANGE

Expression (9.10) is of the most general type. It can be applied to a vast class of specific problems. To prove this fact we start by defining the meaning of technology and technological change in reference to expression (9.10).

Technology is defined in the *Shuratic* system as the medium of learning-by-doing that helps in organizing the functional capacity of the system to reinforce the episteme of unification of knowledge between various artifacts of the world-systems. Thus, within  $\{\theta_j^{\text{ad}}\}$  there is a sub-vector indicating the way to accomplish a functional task denoted by the corresponding  $\{X_j^{\text{ad}}(\{\theta_j^{\text{ad}}\})\}$ . Yet, because of the extensive linkages between diverse possibilities in this system it is necessary to recognize the functional transformations of the sub-vector  $\{\theta_j^{\text{ad}}\}$  into the knowledge-induced forms  $\{X_j^{\text{ad}}(\{\theta_j^{\text{ad}}\})\}$ . Primed variables denote sub-vectors. That is, we can select that particular label for  $j = T(\cdot)$  say, that would correspond to technology and treat this with the rest of the relations along that particular branch of the string (9.10). Once this sub-string is constructed we can interconnect it with all other similar strings. A nexus of interlinked relations is, thus, established in the knowledge-induced plane.

Accordingly, we now define technology by the sub-string:

$$\text{Technology, } T(\cdot) = T(\{\theta_j^{\text{ad}}\}, X_j^{\text{ad}}(\{\theta_j^{\text{ad}}\}))$$

such that all the other attributes of expression (9.10) hold. Besides, the social wellbeing function is defined by:

$$W = W_j^{\text{ad}}(\{\theta_j^{\text{ad}}\}, X_j^{\text{ad}}(\{\theta_j^{\text{ad}}\}), T(\{\theta_j^{\text{ad}}\}, X_j^{\text{ad}}(\{\theta_j^{\text{ad}}\})))_k. \quad (9.12)$$

From the simulation of  $W$  with respect to the circularly recursive endogenous and complementary interrelations between the variables,

$$\{\{\theta_j^{\text{ad}}\}, X_j^{\text{ad}}(\{\theta_j^{\text{ad}}\})\}, \text{ we obtain } T(\{\theta_j^{\text{ad}}\}, X_j^{\text{ad}}(\{\theta_j^{\text{ad}}\})),$$

with

$$i = 1, 2, \dots, m;$$

$$j = 1, 2, \dots, n;$$

$$s = 1, 2, \dots, S;$$

$$l = 1, 2, \dots, N_i;$$

$$k = 1, 2, \dots, K.$$

Such a circular causation model is the essence of the evolutionary epistemology of the process-oriented IIE-model or the *Shuratic* process underlying expression (9.10).

The vector of complementary technology,  $T(\cdot) = \{T_1, T_2, \dots, T_k\}$ , playing its role in the total system of endogenous relations, denotes the knowledge-induced layers of technologies. In these layers of techniques even the least efficient technology, which according to Mathur (1989) plays an important role in determining the choice of technology, is supported by all other techniques that, together, play their interactive, integrative and dynamic roles (IIE) in diversifying the joint production system into layers of productive systems.

As an example, we have the dynamic input-output model in which the I-O coefficients become policy induced by a vector of policy and program variables that are discourses to revise the I-O coefficients. Hence, such a vector can be treated as a technological change parameter used to correct the time-dependent or fixed I-O coefficients (Choudhury, 2001a). Azid (2001) has conceptualized a dynamic I-O model with layers of techniques in which even the most inefficient technique is shown to play an important role in technology choice.

Unlike the case of the theory of layers of techniques in the literature (Mathur, 1977), the concept of knowledge-induced technology and layers of techniques within it, gives rise to embodied technology that is pervasively endogenous in relation with all state and policy variables. Consequently, we cannot accept the weighted average I-O coefficient for the dynamic I-O coefficient of layers of techniques in a joint production system. Rather, because the joint production concept is of the nature of an interrelated system in which technology, inputs, outputs and revenues are all shared according to the IIE-processes across such production systems, therefore, a multiplicative type joint production function is in place (Klein, 1946). Consequently,

$$Q = B [\Pi_{i,j=1}^n Q_{ij}^{\text{bij}}]^{1/n \text{ square}} \quad (9.13)$$

and

$$b_{ij} = d \log Q / d \sum_{ij} \log Q_{ij} \quad (9.14)$$

are the elasticity coefficients of the inter-sectoral joint production menus,  $Q_{ij}$ .

$Q_{ij}$  denotes the joint production menu between pairs of production and, hence, across all possible product diversification.

$$Q_{ij} = B_{ij} [Q_i^{\text{ai}} Q_j^{\text{aj}}]^{1/2}, \quad (9.15)$$

$$Q_i = \sum_j Q_{ij} \quad (9.16)$$



where  $B$  and  $B_{ij}$  are coefficients defining production shifts under the impact of knowledge-induced layers of techniques (Denison, 1962;  $i, j = 1, 2, \dots, n$ ).

Every one of these variables is induced by the knowledge-flow vector, which itself reaches a limiting value out of the rounds of interaction that take place within the *Shuratic* process leading to integration (consensus). We denote the limiting value of the knowledge-flows by  $\theta$ , without a further change of symbol.

$$a_{ij}(\theta) = Q_{ij}(\theta)/Q_j(\theta) \text{ is the dynamic I-O coefficient.} \quad (9.17)$$

In the matrix form, the dynamic I-O system is written as:

$$[(I-O(\theta))Q_j(\theta) = q_j(\theta)] \quad (9.18)$$

where  $Q_j(\theta)$  and  $q_j(\theta)$  are the knowledge-induced column vectors of total output and value added in an effective product-diversification joint production system.  $A(\theta)$  denotes the matrix of knowledge-induced dynamic I-O coefficients. The appearance of  $\theta$ -value equals  $\lim_{k \rightarrow \infty} \{\theta_{ij}^{(k)}\}$ , when interactions are taken over all  $(i, j, s, l)$  in the ensuing *Shuratic* process. The convergence of the limiting knowledge-flow can be further improved by letting "Nk" assume sequential values over every round of interaction, integration (convergence) and creative evolution (IIE-process). In this case, "Nk" may belong to the natural-number system or the real line. In deeper scientific problems "Nk" can also be taken up in higher dimensional spaces (Choudhury, 1993a).

Although no particular type of movement in  $\theta$ -value needs to be presumed, yet for mathematical simplicity alone, we assume that the converging sets of  $\theta$ -values over subsequent rounds of discourses move in a stable trend over time with growth rate  $g(\theta)$ . Then:

$$\theta_k = \theta_0 \int_{\theta_0(\theta_k)} \exp(g(\theta) \theta) d\theta \quad (9.19)$$

We can now re-write expression (9.18) in the two-equation system,

$$[(I-O(\theta_k)) Q_j(\theta_k) = q_j(\theta_k); \theta_k = \theta_0 \int_{\theta_0(\theta_k)} \exp(g(\theta) \theta) d\theta] \quad (9.20)$$

Now, although not shown but implied, each of the output variables is strongly affected by the technology  $T_k$ , as earlier defined in terms of complementary relations across all state and policy variables.  $T_k$  is, thereby, equivalent to one of such  $\theta_k$ -values describing the weight assigned by discourse on the particular methods and instruments of the *Shar'ah* that are used to generate expression (9.20). Because of the endogenous nature of technology in this joint production system explained by *Shuratic* recursions, we define:

$$T_{k+1} = T_k + (\theta_{k+1}, Q_j(\theta_k)) \quad (9.21)$$

together with  $Q_j(\theta_{k+1}) = Q_j(\theta_k + T_{k+1})$  and expression (9.20).

With the further assumption on adaptive  $\theta$ -values, and hence of  $Q_j(\theta_k)$ -values as mathematical simplicity, the stability in  $\theta$ -values is transmitted over the entire system shown by expression (9.20). Consequently, the choice of  $T_k$  too comes about by stable recursive adaptation in the *Shuratic* process. Now in a limiting sense of such a technological choice we obtain,

$$\left. \begin{aligned} T_k &= T_0 \int_{\theta_0(\theta_k)} \exp(g(T(\theta), Q_j(\theta_k))) d\theta_k, \\ \text{given, } \theta_k &= \theta_0 \int_{\theta_0(\theta_k)} \exp(g(\theta) \theta) d\theta. \end{aligned} \right\} \quad (9.22)$$

The differentiated technological transformations  $T_k$  are the layers of techniques in the endogenous knowledge-induced complementary production system with extensive product diversification in place as a result of the underlying IIE-processes and joint production menus.

It is readily found now that the nature of  $T_k$  in terms of the cumulative  $\theta$ -value in the IIE-process is of the embodied type. Each vintage of machines and techniques becomes induced by the recursive  $\theta$ -values and, thereby, by the reinvestment of a proportion of  $Q_j(\theta_k)$  into the reproduction of technological transformation. The obsolescence of machines, equipment and techniques is, thus, increasingly postponed under the recursive progress of the regenerative  $\theta$ -values. Mathur's least efficient technique in older vintage of assets is now supported by the evolutionary techniques  $T_k$ . This is a strong Islamic result in terms of the complementary relationship among state variables, policy variables and projects and programs that carry forward the unification of the economic system. That unification paradigm and the design and choice of the consequent joint production system is found to be retrospectively premised on the string relation (9.11), which is derived from the *Tawhidi* epistemology of unity of knowledge.

### Some points to note in the formalism of production and technology in light of the *Shuratic* worldview (IIE-process)

#### Knowledge and time: a Qur'anic philosophy of science

It can be noted that the dynamic nature of production and technology in light of the IIE-process model of joint production depends centrally upon  $\theta$ -values and not on time. This is due to the philosophy behind the *Tawhidi* episteme, according to which time is subservient to knowledge (*Qur'an*, 45:21, 70:4). Time is used merely as a medium for recording sequences of events. But events happen by the command of *Allah* alone. Only after this happening are the events then functionally understood and explained in the *Qur'anic* world-systems by the knowledge-flows,  $\theta$ -values. The temporal flow of time is, thus, an ordinal measurement of interactions as they appear in the real and complex topologies at the moment that

certain events occur and that need to be recorded. As, for example, the creation of the universe according to *Qur'an* (7:54) took place over Six Days, which is a divine precept that has no equivalence with recorded time. Likewise, there is no measurement of time around the event horizon of the Black Hole (Hawking, 1988). In the simultaneity theory of General Relativity, time is used simply to record an event that occurs upon the incidence of light upon material particles, and the same event changes its configuration in different geometrical frames of reference and by the speed with which such frames move (Einstein, 1954). Thus, there is no equivalence between time and event in different geometrical frames of reference according to their speed of movement.

According to the *Hadith al-Qudsi* there is only one form of equivalence between Time and Knowledge. That is at the primal level of *Allah*. The *Hadith al-Qudsi* (Al-Bukhari and Muslim sources of *Hadith*) is narrated on the authority of the Prophet Muhammad's companion, Abu Hurairah, who said that the messenger of *Allah* has said: "Sons of Adam inveigh against the vicissitudes of Time, and I (*Allah*) am Time, in My hand is the Night and the Day." In accordance with this *Hadith* and the assumption of the equivalence between knowledge-flow and time in the infinitesimal core of reality premised on the unity of knowledge, we can then say that time equals  $\theta$ -values according to the numbered interaction in the real and complex spaces of events. In regard to the complex spaces of  $\theta$ -values and, hence, of interaction, the *Qur'an* mentions the nature of transcendental time prior to the creation of man on earth (*Qur'an*, 76:1, 103:1). There are mentions of different dimensions of time in the world of the dead and between the world and the Hereafter.

In the substantive meaning of the difference between temporality and knowledge-flows we must have:

$$t = t(\theta). \quad (9.23)$$

" $t$ " now appears as recorded time according to the prior occurrence of an event that is read by knowledge-flow or an event that the knowledge-flow creates by the command of the transcendental Time, which is the primal unity of knowledge as the Oneness of *Allah*.

### ***Production and technology in light of the conception of knowledge and time***

Now, with technology and production recorded by time as in expression (9.23), consider the following derivative:

$$dT_k/d\theta = (\partial T_k/\partial t)(dt/d\theta) + (\partial T_k/\partial Q_j)(dQ_j/d\theta) + \partial T_k/\partial \theta. \quad (9.24)$$

Since each of the terms on the right-hand side of expression (9.24) is positive, therefore,  $dT_k/d\theta > 0$  implies a result that is quite contrary to what can be interpreted from  $dT_k/dt$ , when  $t$  remains independent of  $\theta$  and exists as an independent variable, as in all of mainstream economics. In the second case, we are not sure of the sign of the derivative, and all the terms of expression (9.24) turn out to have undefined signs. Thus, only the primacy of knowledge over time can set time equal to interaction that generates knowledge-flows in the first place in mathematically real and complex spaces.

The substantive nature of knowledge-flows over temporal time-flow presents the special way that the concept of technology is treated with the meaning of science in the IIE-methodology. *Ta'uhidi* epistemology as the philosophy of science in the IIE-methodology treats time according to expression (9.23). Now, since the concept of technology and layers of techniques remain complementary to all the systemic variables and their relations, therefore, these are coterminous with science. We say, therefore, that machines and technology acquire their artificial intelligences in accordance with how we design and program them for the totality of the *Ta'uhidi* world-systems (Choudhury, 1998). With such recursively developed mathematical programming or simulation by the *Shuratic* process methodology, all of the entities of the *Ta'uhidi* world-system become conscious ones by virtue of their primal relationship with *Ta'uhid* and with the knowledge-flows that emanate from the fundamental *Ta'uhidi* episteme.

In light of the principle of universal complementarity across diversity of possibilities in the IIE-processes, the  $\theta$ -values have endogenous relations with the rest of the state, policy and instrumental variables, just as these variables are endogenously related with the  $\theta$ -values, and vice-versa. In this order, the functional relation between knowledge and time is an exception of the general category, as explained earlier.  $\theta$ -values can be inverted into time-value if, and only if, we take  $t = \theta$  in the infinitesimal core of a space of recorded event, but not otherwise.

Our simulation of the social wellbeing function in expression (9.12) is done by taking up all the explained interrelationships in the *Shuratic* processes with the above specification of the knowledge-time relationship and the circularity of the endogenous relations between knowledge and the state, policy and instrumental variables. These processes define the recursive relationship of any one variable with respect to all the remaining variables. This kind of endogenous relation would also cause the  $\theta$ -values to be recursively determined in terms of the state, policy and instrumental variables in the *Shuratic* processes. This fact points to the endogenous nature of  $\theta$ -values, contrary to the nature of independence of time dimension in a time-dynamic system without the primacy of knowledge-flows in it (al-Azm, 1967).



### Capital accumulation in the knowledge-induced joint production system with endogenous technology

The nature of capital accumulation in the IIE-process model can be seen in terms of the attributes of linkages, complementarities and product-diversification.

Capital accumulation in the IIE-framework is a process, whereby resources are mobilized in the *Shari'ah*-recommended directions of spending in the "good things of life." The embodied nature of capital investment in human development, techniques and machinery suggests that every bit of the output,  $Q_j$ , is recycled in these directions. Nothing is saved in the macro-economic sense of gaining interest on idle money capital in banks. The concept of resource mobilization as spending in the *Shari'ah*-recommended directions is contrary to the concept of savings as money capital withdrawn from spending and held as idle capital by banks in monetary assets without real sector linkages (paper money as opposed to real money, see Choudhury, 1997).

More formally, the flow of capital investment ( $I_j$ ) that is formed from the source of output ( $Q_j$ ), is given by the following relation:

$$I_j = a_j Q_j. \quad (9.25)$$

Here,  $a_j$  is a suitable proportion of the output drawn out for investment.  $I_j$  is subject to the entire field of recursive relations as implied by expression (9.11) to which  $Q_j$  is due. Now by the definition of gross capital formation ( $K_j$ ) we obtain:

$$K_j = \int_{\theta \in [\theta_k]} I_j(\theta) d\theta = \int_{\theta \in [\theta_k]} a_j Q_j(\theta, T(\theta)) d\theta \quad (9.26)$$

as established in expression (9.21).

By the circular causation between variables, the following relations also qualify the determination of  $K_j$ :

$$T_k = T_0 \int_{\theta \in [\theta_k]} \exp(g(T(\theta), Q_j(\theta))) d\theta, \quad (9.27)$$

as shown in expression (9.21), given:

$$\{\theta\} = \theta_0 \int_{\theta \in [\theta_k]} \exp(g(\theta)\theta) d\theta. \quad (9.28)$$

Additionally, one could include the further feedback determination of  $\theta$ -values in terms of the state, policy and instrumental variables, which in expressions (9.26)–(9.28) are the recursive values of  $\{\theta, Q_j, T(\theta)\}$ .

Just as the total economic output in the purely complementary joint production system is in a multiplicative form involving  $Q_{ij}$  in expression (9.13), so also the total economy-wide capital stock is of the multiplicative form in the  $K_{ij}$  leading to  $K_j$  in expression (9.26) (Choudhury, 2001b).

It can be shown that because of the nature of complementary linkages of all such variables across the economy, the impact of employment, capital accumulation (formation), output generation and layers of techniques are uniformly reinforced across such a participatory system. But for all such complementary relations to be sustained, their important relationship with cost- and risk-diversification must exist. We will now examine this topic briefly.

### Cost- and risk-diversification in the complementary network of jointly productive relations

The inter-project, inter-sectoral, economy-wide distribution of investments ( $I_j(\theta)$ ) as a form of spending is equivalent to the distribution of the cost of joint production in the knowledge-induced participatory economy. It is noted that the absence of interest rate in a pure Islamic economy negates the validity of opportunity cost of capital and the valuation of assets by means of such discount rates. The replacement of discount rates by forward rates of return in a simulimative terminal-value formula of asset valuation means that such rates are shared among participants in a joint venture. Likewise, insurance and freight costs can operate in the Islamic way by *Takaful* (insurance). Such financial costs form part of the  $I_j$  and  $K_j$ , since financial businesses are run under the same principle of cost and profit sharing (*Mudharabah* and *Musharakah*) (Siddiqi, 1985). The complementary nature of participation and the continuously learning feature of the IIE-process, with only simulation instead of optimization prevailing in its social wellbeing criterion function, make the neoclassical idea of marginal rate of substitution illogical in such a knowledge-induced participatory economy.

Consequently, now, the notion of opportunity cost of resource allocation is replaced by cost and revenue (or profit) sharing among an increasing number of participants and opportunities. The simulimative complementary aspect of resource allocation in the knowledge-induced participatory system does not rule out relative differentials in the use of factors of production and goods. But, whatever decisions are made in such cases are perturbed by the process orientation of the IIE-methodology. Hence, the usual concave shape of the origin production possibility curve and the convex form of the origin consumer and social welfare indifference curves cannot exist in the knowledge-induced resource allocation system. Consequently, relative prices are not determined as in the neoclassical case. Instead, relative prices arise from evolutionary "expectational" market equilibriums of the classical economic type (Boulding, 1955; Grandmont, 1989; Choudhury, 1993b).

$$\text{The unit cost of production is given by } C_{ij} = I_{ij}/Q_{ij}. \quad (9.29)$$

$\theta$ -value is implied here.

Unit cost of production sharing among participating agents  $P_{ij}$  in the  $(i,j)$ -relationship is given by:

$$c_{ij} = C_{ij}/P_{ij} = I_{ij}/P_{ij} Q_{ij}. \quad (9.30)$$

From (9.30) we obtain:

$$\log c_{ij} = \log I_{ij} - \log P_{ij} - \log Q_{ij}. \quad (9.31)$$

That is:

$$c_{ij} \bullet = I_{ij} \bullet - P_{ij} \bullet - Q_{ij} \bullet. \quad (9.32)$$

The  $\bullet$  variables denote rates of change in these variables with respect to the knowledge-flows,  $\theta$ -values; that is, in reference to the increasing participation in the *Shuratic* process, which is inherent in all of these determinations. Clearly then, the rate of change in the unit cost of production sharing,  $c_{ij} \bullet$ , declines as the rates of  $I_{ij}$ ,  $P_{ij}$  and  $Q_{ij}$  increase together, with respect to  $\theta$ -values in the ensuing *Shuratic* processes. The increase in  $P_{ij}$  signifies diversification of risk by participation among risk-takers. The increase in  $Q_{ij}$  signifies product diversification. Consequently, a vibrant *Shuratic* process in the extensive meaning of participation between human agents and the cosmic (economic) system in light of the *Shari'ah* and the simulation of the social wellbeing function, achieves risk-diversification through product-diversification and increased systemic participation. These three conditions are causally interrelated.

The actual risk of the unit cost of production sharing  $R(c_{ij})$  is measured by the expression:

$$R(c_{ij}) = [(1/mn) \sum_j \sum_k (c_{ij} - c_{ij}^*)^2]_k, \text{ as } \theta \rightarrow \theta_k. \quad (9.33)$$

$\theta$ -values are taken here in the limit of the  $k$ th number of interactions converging to a certain level of integration and evolving from there to new *Shuratic* processes. Note the difference from the definition of risk in mainstream economics. This is due to the fact that the variation of  $c_{ij}$  must be taken around the limiting value  $c_{ij}^*$  in the  $k$ th number of interactions, not necessarily around the mean value of  $c_{ij}$  if the mean value of  $c_{ij}$  is different from  $c_{ij}^*$  appearing at the  $k$ th number of interactions for a limiting value of  $\theta_k$  that causes  $c_{ij}^*$  to be attained in the probability limit.

### Evolutionary layers of techniques in the IIE-process

Expression (9.24) explains the evolutionary nature of layers of technique by the force of  $\theta$ -values for all values of  $k$  as numbered interactions in the *Shuratic* or IIE-processes. As  $T_{jk}$  evolve, shown by the positive sign in

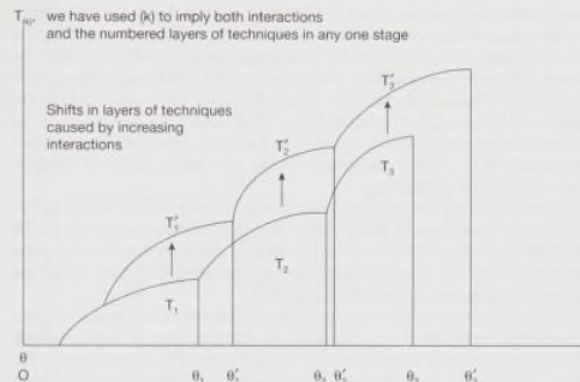


Figure 9.1 Evolutionary (shifting) layers of techniques,  $T_k$ , under the impact of knowledge induction,  $\theta$ -values

expression (9.24), they acquire multiple punctuated equilibriums in terms of the other variables. In this way, evolutionary  $\theta$ -values get determined in terms of simulated values of the state, policy and instrumental variables. An endogenous process of the circular causation type is thus generated in the IIE-process methodology, as explained by expression (9.11), now applied to layers of evolutionary techniques under the influence of the *Tawhidi* knowledge-flows. This relationship of evolutionary knowledge-technology is shown in Figure 9.1.

In Figure 9.1,  $T_j$ ,  $j = 1, 2, 3$  denote a set of layers of techniques for a given interactive process. As interactions increase, the same layers shift into higher vintages of techniques,  $T_j'$ ,  $j = 1, 2, 3$  at the correspondingly higher  $\theta$ -values, as shown. In this way,  $T_j$  is enhanced to  $T_j'$ , as embodied technological change induces improvement in older vintages of techniques.

### 3 APPLYING THE IIE KNOWLEDGE-INDUCED TECHNOLOGICAL CHANGE TO THE CASE OF AUTOMOBILE INNOVATION IN MALAYSIA

Malaysia's pride and joy in her manufacturing sector is her national car, the Proton Saga. The history of manufacturing development in the Malaysian automobile industry is an interesting case of proven success in the growth of



layers of techniques within this industry. It gained its momentum from the co-operative ventures on which the Proton's success depended. The automobile industry was committed to participating in joint ventures with a majority share being held by the Malaysian partners, who included the Heavy Industry Corporation of Malaysia (HICOM) and Perusahaan Automobili Nasional Berhad, from which comes the name PROTON. Razib and Rugaya (2001) point out how the Proton Saga has grown out of a joint venture and assembly plant with Japanese expertise, into a major shareholder of car sales in Malaysia and has now taken charge of 100 per cent manufacturing capacity.

Figure 9.2 shows the progress of the Proton model for the period 1984–2000 (Razib and Rugaya, 2001). We will categorize the model changes by layers of techniques as identified below. Similar car-model trends over years are denoted by one set of techniques. New car-models in given years are denoted by shifts in the sets of techniques.

Thus, according to the concept of knowledge-induced layers of techniques used in Figure 9.1, we identify the following set of Proton brands according to layers of techniques: T1: Saga Orion, T2: Saga Magma, T3: Saga 12 Valve, T4: Saga Iswara. These models form the early set of layers of techniques.

The shift from the above level to a higher level of layers of techniques was achieved by Proton in 1994 when the car went into the full model change. This new set of techniques comprises: T4': Wira 1.5 and 1.6, T5': Wira 1.3 and 1.8.

Subsequently, with greater learning in joint ventures and internal efficiency gains with human resource development and with many input linkages it was possible to shift to the following interconnected brands, i.e. new shifts in techniques (continuity is shown by arrows in Figure 9.2):

T5'': Perdana 2 litres	} comprise one set of shifted techniques
T6'': Perdana V6	
T5''': Satria 1.3 and 1.6	} comprise one set of shifted techniques
T6''': Satria 1.8	

In 1996, it was possible for the layer of technique to shift the T5''' model to T5''''; Tiara. In 1997, followed the new model by another shift in the layer of technique T5'''' to T5'''''; Putra. In 2000 came about a further shift in the layer of technique T5'''' to T5''''': Waja 1.6.

The impetus working behind all these upward shifts that defined the embodied technology in Malaysian car manufacturing was the *joint venture*

Year	Model	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
		PROTON SAGA (ORION)			PROTON SAGA (MAGMA)		PROTON SAGA (12 VALVE)		PROTON SAGA (ISWARA)									
																	</	

Figure 9.2 Model changes as layers of techniques in the Proton Saga automobile industry in Malaysia

co-operative program and the gainful advance in capturing market shares both domestically, and with an increasing number of Proton models being sold overseas. The old models of machines were not fully retired. They were improved to newer models as advances in technology came about. Thus, a good deal of complementarities among a diverse number of models was attained. This helped also in diversifying and reinforcing the productive inputs and the skill and human development in the car manufacturing industry.

Figure 9.3 shows the shifts by sets of layers of techniques, as mentioned above, under the impact of interactive mechanisms between vintages of techniques in the car manufacturing industry for the period 1984–2000.

Figure 9.3 corresponds to Figure 9.1. The encircled region in Figure 9.3 shows the intensity of the dynamic transformation of technology in the automobile industry in Malaysia. It was also during this phase that many of the lessons learned about integrated manufacturing systems from the Japanese in the earlier phases of Proton development were transferred

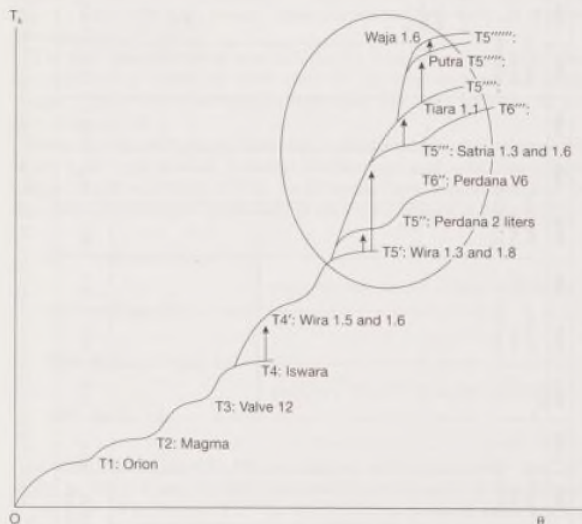


Figure 9.3 Shifts in knowledge-induced layers of techniques in the Malaysian automobile industry

into the R&D department domestically. The joint venture and co-operative mechanism advanced from one layer of technique to another without allowing for ready obsolescence in the previous techniques. This perspective came to be institutionalized in the Proton industry under the philosophy of joint ventures pursued by HICOM.

### How is the *Tawhidi* epistemology of unity of knowledge applied to the case of knowledge-induced layers in the Proton automobile industry?

The question now is this. How can the Proton development experience explain the aspect of the *Tawhidi* epistemology found in the principle of complementarities, diversity and participation? To answer this, one notes the fact that the diversity of technological advancement realized by Proton, particularly during the period 1994–2000, was the result of the co-ordinative and participatory medium of learning and decision-making through joint ventures that the principle of complementarities promotes. The IIE-process is fully realized in the midst of such an endogenous phenomenon of learning in concert with policies, programs and market reality. The more extensive is the interactive process leading to consensus (integration) and creative evolution, the more effective becomes the product-diversification and the risk-diversification that ensues from this. The emergence of different models of Proton as the Malaysian national capital asset, explains the knowledge-induced layers of techniques from which one can learn about successfully integrated manufacturing processes geared by the well co-ordinated and co-operative joint-venture approaches.

### Certain policy directions for a *Shari'ah* conscious transformation of the Proton automobile industry in concert with Islamic development-financing instruments

Beyond the above remark on co-ordination and co-operation by joint ventures there are also critical observations to be made with respect to the business perspectives of Proton for future economy-wide contributions in which Proton would share. This calls for certain policy propositions.

It is not known whether the development activities within the region shown in Figure 9.3 were causally related to any Islamic development-financing instruments, such that the layers of techniques in the Proton industry could have gained from these and could have reinforced the Islamic development-financing instruments for Proton's further advancement.

True Islamic development and its onwards reinforcement of the economic performance could be enhanced if the activities of the period 1994–2000 were complemented by the Islamic financing instrument of mobilizing resources in the direction of manufacturing development, including the



Proton development, and the development of all those inputs in diverse economic sectors from which Proton, as an example, would benefit. In this way, development financing, resource mobilization in the direction of product-diversification, would also generate cost and risk-diversification by virtue of cost and production sharing between participatory agencies, as in the case of joint venture.

There is a causal two-way endogenous relationship in the above recommendation between resource mobilization leading to productive spending and in realizing production and risk-diversification. Such a two-way feedback is the essence of the simulative circular causation property of the IIE-process within which the social wellbeing function is simulated with all the relational conditions pertaining to the variables of the social wellbeing.

Resource mobilization leads to productive spending in accordance with the tenets of the *Shari'ah*, not to financial saving in financial intermediaries. The result of resource mobilization, then, is a multiplier impact on income growth with appropriate products and stable markets. Economic stability is attained as the prices of goods stabilize with expanding supply. The positive employment effect in this relationship, along with machinery, capital and technology, adds to the social and economic gains and sustainability of real income and output growth.

The Proton revenues should, thus, be enhanced by the sale of affordable Malaysian cars. This would help capture market share. The revenues so generated should then be circulated as resource mobilization for capital development.

This above recommendation reflects the capital accumulation process that we have earlier referred to in terms of embodied technical change in the knowledge-induced production system with layers of techniques.

Inducing resource spending as resource mobilization requires zero to low interest rates, which is the primary goal of development financing in Islamic financial intermediaries. On the other hand, the returns on financing by means of equity participation (*Musharakah*) and profit-loss sharing (*Mudharabah*) under economic co-operation are inversely related to interest rates and are specially conducive to output growth, development sustainability and productive transformation in accordance with *Shari'ah* requirements.

If this approach to financing Proton development is adopted, the activity in the encircled region in Figure 9.3 would create productive employment and diverse product designs, with effective control of environmental pollution by eliminating the waste due to obsolescence and by interlinking various layers of techniques.

The above recommendation leads into the adoption of Islamic values by way of embracing the principle of complementarities of relations between diverse opportunities, and in human resource and capital development. Such endogenous variables, along with the Islamic financing instruments

replacing the rate of interest for mobilizing resources, now enter the highly interactive, integrative and evolutionary system of interrelationships involving the simulation of the social wellbeing criterion connected with the automobile industry in Malaysia.

Finally, it is recommended that the important Proton industry along with the co-operating financing intermediaries should develop a blueprint of a social wellbeing goal and choose such targets, policies, programs and instruments that would jointly promote the development of mutual profitability, and address the social milieu as well. The Proton, like any other good and service in the economy, would then turn out to be a social good. Private profitability and social benefits could then be generated by a quantitative simulation of the social wellbeing goal as a blueprint, using the dynamic approach of the *Shuratic* process, as explained in this chapter and involving the features of the Islamic political economy.

#### 4 CONCLUSION

The *Taushidi* worldview explained by the IIE-process methodology or the *Shuratic* process methodology has been applied in various contexts to explain the intrinsically unified nature of the *Qur'anic* world-system. This proves the practical and extensive application of the model of unity of knowledge in various problems and issues of the world-systems. Care in this interpretation must be noted.

The application of the *Taushidi* precept of unity of knowledge is realized by the development, and use, of economic instruments that emanate from, and then reinforce, the essence of systemic unity. This premise in our knowledge-model is the *Taushidi* episteme. In the Islamic world-system the principal instruments revolve around economic co-operation, social justice and balance in view of the principle of universal complementarities with diversity and endogenous moral and ethical values. These are not to be found in any other world-system.

They are markedly foreign to all the neoclassical prototypes of marginal substitution (competition and tradeoff). Thus, we cannot apply the same methodology to the automobile innovation of an American manufacturer, as the instruments of financing and product development in that manufacturing are based on interest. The assumption of scarcity of resources leads to competition between automobile manufacturers and to cyclical downturns in the American automobile industry. Technological innovation is costly, in terms of both direct, and social, cost of pollution and congestion, etc. Even in the case of Malaysia, we have pointed out that the realization of layers of techniques by means of the principle of complementarities is far from being adequately realized. That is because the underlying non-*Taushidi* environment of economic, organizational and technological arrangements abounds.

In this chapter we have taken another step towards conceptualizing and explaining the *Tachidi* worldview. We have shown, once again, here, that the methodological conceptualization of the *Tachidi* worldview in the sciences and the political economy of world-systems is substantively different from mainstream economic reasoning. The principle of universal complementarities across diverse opportunities, as recommended by the Islamic law, the *Shari'ah*, is shown to emanate from the IIE-process methodology. It describes systemic unity among agents and variables and their relations. The idea of the *process of Shura* dynamics is, thus, extended over a wider field of understanding than being simply limited to human and political institutions. This is an inference derived from the *Qur'an* (42:49-53) and in terms of the principle of "pairs" and diversity presented by the *Qur'an* as messages of understanding for all world-systems (*Qur'an*, 13:3).

The conceptualization and application of the *Shari'ah* process to the substantive theme of knowledge-induced layers of techniques is an original contribution. Besides, its use in explaining the transformation of the Malaysian Proton automobile industry proves that the *Tachidi* unification methodology of extensive participation and linkages can be applied widely with explanatory power.

Yet, certain *Shari'ah*-related recommendations were made to further advise how the Proton automobile industry, along with the Islamic financial sector, can co-ordinate and co-operate to promote a substantively participatory economy, wherein effective risk- and production-diversification can be realized. Such issues of economic stability are all the more important in these days of uncertainty with foreign direct investment and economic vulnerability to speculative finances that portfolio investments bring with them.

This chapter is the first in the area of (*Tachidi*) knowledge-induced layers of technique with its application to a practical case in light of the *Tachidi* epistemological worldview of unity of knowledge. Its effective conceptualization and proven application establish the fact that the paradigm of the Islamic world-system, with its distinctive socio-scientific meanings, rests upon a methodological understanding, development and application of the *Tachidi* epistemology as the praxis in all spheres of life and action.

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## 10 Conclusion

This book has covered the theme of the world-system in its comparative political, economic and epistemological perspectives between Islam and the occident. In developing the Islamic theory of the world-system and its nature of polity-market interaction, the principal sources of Islamic epistemology, namely the *Qur'an* and the *Sunnah*, were thoroughly used. Upon this premise, a discursive study was undertaken in light of the contributions by scholars of the Islamic scholasticism to various topics in the subject area. Likewise, the comparative theme of the world-system was analyzed from the contemporary occidental thought and the scholasticism of the eighteenth-century European Enlightenment.

The comparative study of the Islamic and occidental epistemes led us to derive a methodology for the former that is quite different from the latter. The process-oriented discursive methodology of the IIE-process order, equivalent to the *Shariat* process, generated a series of logical conclusions that turned out to be different from the occidental concepts, methods and applications to unique problems of markets and polity.

In our comparative study of the methodology of world-systems that guides the changing facets of civilizations, we have found that serious thought along lines of the unity of knowledge was given by the greatest exponents of the occidental world-system. Yet, it appeared that the project on unification of the sciences and the unity of knowledge in the social sciences was impeded by the failure to substantively incorporate divine unity as a logical and living reality in the scientific worldview. That divergence between metaphysics and scientific inquiry went wrong during the eighteenth-century Enlightenment in Europe and the divine law was compartmentalized separately from scientific inquiry.

Science developed in great strides but without the moral roots of inquiry. Rationalism became the altar of the philosophy of science. We pointed out the recent work of Edmund Husserl, lamenting on the severance of the moral spirit from Western science. If the objective of science, differently from technology, is to explain the universality of logical principles by a minimum of axioms, then the departure of Western science from a systemic integration of the Oneness principle, while rendering itself to rationalism

instead, caused the partitioned view of matter and mind, of body and soul, of spirit and matter. Individualism is the result of this extreme view of social reality in which we showed that unity of the world-systems becomes impossible.

Returning to the formal systems analytic of the Oneness of *Allah* as the essence of the divine law is where Islam reintroduces unity of the world-systems on the premise of the moral legacy of the human race. This becomes the universal principle for all mankind. The *Shuratic* process or the IIE-process methodology, presented and used in this book, proved to be a challenging praxis, even to the prevalent Islamic thinking in economics, society, institutionalism, social contract and science. The two contrasting viewpoints were expounded with respect to many real issues of theory and practice. In the end, we proved that the uniqueness of the *Tawhidi* unity of knowledge is the episteme for all of the themes that we have discussed in this book. Many more were hinted upon for a similar conceptualization and application. The policy-theoretic perspective in the area of polity-market interaction using the *Tawhidi* worldview of unity of knowledge, also turned out to be profoundly superior to the neoclassical orientation of both mainstream economics and Islamic economics today.

We have thus shown that the IIE-process methodology, divulging a formal systems oriented explanation of the *Tawhidi* unity of knowledge, is a revolutionary episteme for socio-scientific inquiry for all people without inhibition of religions and cultures. Such a universality of the *Tawhidi* praxis makes this episteme of Oneness of *Allah* an everlasting core of all reality, a universal, for all peoples without space-time limitation.

The very formal systems-oriented derivation and application of the *Tawhidi* episteme in general problems of world-systems inevitably caused the approach in this book to be a compendium of various disciplines and topics. These ran across economics, sociology, philosophy of science and mathematics. Such a natural propensity to an interdisciplinary scope of the scientific investigation in this book has further established the universality of the theory and application of the formal systems analytic of the *Tawhidi* episteme in all world-systems.

The *Qur'an* declares about the universality of the Oneness of *Allah* over all the world-systems (*Alameen*) (Chapter 1, The Opening):

Praise be to *Allah*,  
The Cherisher and Sustainer of the Worlds;  
Most Gracious, Most Merciful;  
Master of the Day of Judgment  
You do we worship  
And Your aid we seek.  
Show us the straight way,  
The way of those on whom  
You have bestowed Your Grace,

Those whose (portion)  
Is not wrath,  
And who go not astray.

These verses and many more like them, fully establish the simple but richly complex causation explained by the *Qur'an* relating to the pervasively knowledge-centered world-systems. Their creative dynamics is laid down in the relationship, "From *Tawhid* in the Primal to *Tawhid* in the Hereafter through the Passage of the Righteous World-Systems."



## Glossary of selected Arabic terms

**Adah** Practices of people.

**Adl** Social justice.

**Ahkam** Rules derived from discourse over *Shari'ah* pertaining to specific matters.

**Akhira** The Hereafter, as the most supreme event, when Justice will be meted out by Allah between belief and disbelief in Allah's Oneness. This is also the event of the manifestation of the perfection, completeness and absolute nature of the divine law of *Tawhid* (see below).

**Al-Alimul Bayyana** Known and unraveled world-systems.

**Al-Alimul Ghayb** Unknown world-systems in respect to their hidden nature.

**'Alameen** All kinds of world-systems created by Allah and governed and guided by the divine laws (*Sunnat Allah*, see below).

**al ashab al-maimana** Righteous people.

**al ashab al-masha'ma** People of falsehood.

**Al-Hisbah fil Islam** The institution empowered to look after the social guidance and regulation of the market according to the institution of *Hisbah* as so authorized. This is a theory given by Ibn Taimiyyah and is in accordance with the *Shari'ah* (see below) in light of social justice and fairness through the market process.

**Allah** The one and true God as the Creator, Sustainer and Cherisher of creation. Allah has no pluralism, shape, form, gender and configuration in space-time and corporeal dimensions.

**Al-Maslaha wal-Istihsan** Social wellbeing for the public purpose, a theory advanced by Imam Shatibi in accordance with the *Shari'ah*.

**Anbiyyas** Supporters of the divine messengers.

**an-Najwa** Secret talk between Allah and the pardonable sinners in the Day of Judgment.

**'Asr** Flow of time as in the *Qur'an*.

**Assabiyya** Early stages of national life fired by group loyalty and zealous abidance by the religious tenets in Ibn Khaldun's *Prolegomena* entitled *Muqaddimah*.

**Ayath Allah** The Signs of Allah made explicit in world-systems in terms of the divinely embedded unity of being as reflected in the scheme of all things.

**Bayyana** That which is unraveled as material evidence for human comprehension of the *Ayath Allah*.

**burhan aqli** Using sheer reason as the way to knowledge.

**Dahr** Transcendental time of the *Qur'an*.

**Falah** Wellbeing as felicity derived in terms of the unity of being in the scheme of all things in light of *Tawhid* (see below).

**Fatara** Re-origination out of pairs among all entities.

**Fauz al-Azim** The Supreme Felicity or Bliss of Heaven.

**Fiqh** (hence *Fiqr*) The science of interpretation of the *Hadith* literature.

**Fitra** Essence of divine truth in everything as the intrinsic nature of creation.

**Furqan** A description of the *Qur'an* meaning Criterion.

**Ghayb** The secret recesses of the truth of the divine laws.

**Hadith** (also *Hadith al-Quds*) Sayings and recommendations of the Prophet Muhammad as guidance for the believers in the way of understanding and practicing the *Qur'an*.

**Hiba** Gift.

**Hima** Protected land during the time of the Prophet that was used for maintaining ecological balance.

**Ihsan** Compassion.

**Ijma** Consensus, but not necessarily unanimity, in discourse over affairs of the Islamic community. *Ijma* and *Ijtihad* (see below) cannot be carried out on established injunctions of the *Qur'an* and the *Sunnah*, as belief in *Tawhid*, the *Sunnah* and related matters. The latter categories form instruments of the *Qur'anic* epistemology.

**Ijtihad** Authoritative fact-finding from the *Qur'an* and the *Sunnah* on matters of the *Shari'ah* through the discourse of the *Shura* (*Shuratic* process, see below).

**Ilm** Knowledge. It appears in three forms in the *Qur'an* – as the primordial knowledge of Allah, in terms of the divine knowledge ingrained in the divine laws (*Sunnat Allah*, see below); the knowledge bestowed on the Prophet Muhammad in the form of the revelation of the *Qur'an* and the Prophet's *Sunnah*; and knowledge derived for worldly matters through discourse in the *Shuratic* process (see below) using *Ijtihad*.

**ilm al-marifa** Our knowledge flows, i.e. evident knowledge in world-systems.

**Iqra** Literally means "to read." The meaning according to the title of the chapter *Iqra* in the *Qur'an* is to invoke the knowledge of the Oneness of Allah and the fullness of knowledge in the *Qur'an*.

**Iqta** Land tenure act governing fair distribution, ownership and maintenance.

**Jahiliyyah** Falsehood as ignorance. Falsehood is also referred to in this book as "de-knowledge" and is equated with rationalism as opposed to the primacy of revelation over reason.

**Jauzh un Bahij** Creation in pairs as the sign of pervasive complementarities between entities as the permanent essence of reality.

**Khalq in-jadid** (also *Khalqa sunna ya'ud*) Re-origination of knowledge and thus comprehension of truth and falsehood by the evolutionary process of human understanding.

**Kharaj** Agricultural tax.

**kun fa-ya-kun** Be and it is.

**Lauh Mahfuz** The Tablet in which the *Qur'an* is preserved in its primordial form for the unraveling of its fullness of the divine knowledge stock only on the Day of Judgment.

**Majlis as-Shura** The consultative body of Islamic decision-making.

**Mizan** Balance and justice conveying *Allah's* mercy to the world-systems to keep them in order and stability.

**Mudarabah** Profit sharing in a co-operative venture between owners and workers or providers of expertise. *Mudarabah* is one of the instruments that replaces *Riba*-based financial and economic activities in the Islamic economic system.

**Mudarib** Participant in a *Mudarabah* contract.

**Murabaha** Mark-up on traded goods as cost-plus pricing. This is an instrument substituting for interest in the Islamic economic system.

**Musharakah** Equity participation in co-operative ventures. *Musharakah* is an instrument to replace *Riba*-based economic and financial activities in the Islamic economic system.

**Musharik** Equity participants in a *Musharakah*.

**Naba ul-Azim** The Great News, i.e. the *Qur'an*, the declaration of Oneness of Allah; the coming of the Revelation with the Prophet Muhammad; the Hereof.

**qadr** Pre-existentialism.

**Qur'an** (hence *Qur'anic*) Literally means "to read," i.e. to invoke divine knowledge. *Qur'an* is the Revealed Book to the Prophet Muhammad and is the message of guidance for all the believing worlds in *Allah's* Oneness and the ultimate majesty of his divine laws.

**Riba** Literally means excess over and above a due claim. In the financial world *Riba* is equated with interest. In the economic world it stands for both financial interest and an undue excess in transaction concerning exchangeables.

**Sabiqun** Those in authority in the Islamic religion.

**Sanad** A way of conveying and recording the *Sunnah* and *Hadith* of the Prophet Muhammad (prophetic guidance).

**Shajaratul-Mubarakah** The tree of blessings in terms of the light of truth that *Allah* spreads over creation.

**Shajaratul-Taiyyabah** The tree of life through the knowledge of *Allah*.

**Shari'ah** Literally means "the way." In connection with the meaning of the straight path of righteousness (*Siratal Mustaqim*, see below), the *Shari'ah* also means the straight path of the divine laws of guidance in the conduct of life. Hence, the *Shari'ah* is the Islamic Law for guidance along the straight path of righteousness as ordained by the *Qur'an* and the *Sunnah* and discoursed by the Islamic learned and conscious community.

**Shura** (hence *Shuratic*) Learned Islamic discourse on all matters of Islamic life and thought across all field of human inquiry (hence, the process of knowledge formation in accordance with the *Qur'an*, the *Sunnah* and the *Shari'ah*).

**Siratal Mustaqim** The straight path of truth as ordained by *Allah* in the *Qur'an* and guided by the *Sunnah* of the Prophet in light of the *Qur'an*. *Siratal Mustaqim* is, thus, the straight path in the sense of guidance of the believers (*Hudal il-Muttaqin*).

**Sunnah** Guidance of the Prophet Muhammad comprising his sayings, practices and recommendations. *Sunnah* becomes the basis of understanding the *Qur'an*. The *Qur'an* and the *Sunnah* form the fundamental epistemology of Islam in everything that is Islamic.

**Sunnat Allah** The divine law. *Allah* does not make Himself manifest in the Created universes (*'Alameen*). Only His laws reflect the essence of unity and balance in the scheme of things.

**Tafakkur** Spiritual consciousness.

**Takaful** Islamic insurance. It runs on pooled capital that is mobilized by the instruments of *Mudarabah*, *Musharakah*, *Murabaha*, etc. to meet exigencies.

**Tawhid** (hence *Tawhidi*) Monotheism or Oneness of *Allah* (hence of the principle of Oneness of *Allah*). *Tawhid* is the source of the absolute, perfect and complete knowledge that unifies all entities by the divine law (*Sunnat Allah*).

**ulul-umri minkum** Those in authority in matters of Islamic decision-making.

**Umamun** Communities in all the diverse world-systems as explained in the *Qur'an*.

**Ummah** (hence *Ummatic*) The conscious world-nation of Islam, referred to in the *Qur'an* as the balanced nation, the momentous event in the history of mankind and as the believing nation in accordance with the *Shari'ah*.

**Umrān** Nation state in Ibn Khaldun's theory of the development of the nation state from the early stage of *Asabiyya*.

**Urf** Customs of people.

**Usul** Foundation of knowledge, also epistemology.



- Waqf** A charitable endowment made by individuals for collective social wellbeing of needy target groups. *Waqf* can be in terms of fixed assets or financial contributions with a long-term continuity of use and benefits.
- Zakah** Mandatory levy on all forms of assets held either in liquid or liquidable form at the time of fiscal accounting in the Islamic state or community. *Zakah* is also accounted for in livestock and the produce of agriculture, rents etc. On financial assets the *Zakah* rate is 2.5 percent of liquidable wealth net of essential expenses at the time of fiscal accounting.

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